

# An emoticon is well worth a few empathetic words

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## Abstract

We report three studies providing evidence that Japanese college students judge emoticons to express emotions as much as empathetic verbal expressions. The effect is observed in the judgements to the message where the emoticon was included, but also in judgements to the replies to that initial message. The results hold for emails as well as for more recent messaging apps.

## 1 Introduction

Emoticons (short for *emotion icon*) are simple representations of faces using letters and symbols. They have been in use at least since the 1980s and started as a simple way of disambiguating rapidly typed messages (Fahlman, 2002; also McCulloch, 2019, chapter 5, for a detailed account). We report three questionnaires providing evidence that *kaomoji* (the Japanese equivalent of emoticons) are an integral part of machine-mediated communication for college students in Japan.

That emoticons can add affective content to text is not particularly striking. Even text layout or stationery choice may augment verbal information (e.g., cute, colorful stationery may imply a happy state of mind). The following describes three alternative uses for emoticons.

1. *Decorative use*: emoticons and other embellishments (e.g., stars, geometrical shapes) increase visual appeal and are similar to pretty stationery. Their role in expressing an emotion, although discernible, is limited.
2. *Utilitarian use*: limited time or physical constraints (e.g., the tiny keys of a mobile phone) lead to truncated, incomplete messages. Emoticons help express what is not explicit in words and are only effective when verbal content is incomplete. Emoticons are a quick and easy way to disambiguate the intended meaning and express what would take much longer to express explicitly in words. But emoticons are makeshift solutions and only effective when verbal content is incomplete or ambiguous.
3. *Emphatic use*: emoticons emphasize emotional content even when the words in the message explicitly express the emotion intended.

The categories above may overlap but they help us determine how integrated emoticons are in communication (see Derks, Fischer and Bos, 2008, for a review of related results and various possible uses of emoticons). Given previous results, emoticons are unlikely to be just decorative (Arakawa, et al., 2006; Derks, Bos and von Grumbkow, 2008; Thompsen and Foulger, 1996;

and references therein). But a utilitarian use would suggest that emoticons are poor substitutes that are ignored in normal circumstances when verbal information is explicit (but see To, 2008, who found that emoticons lead to more accurate interpretations regardless of whether the accompanying text was ambiguous or not).

A possible argument against utilitarian uses is that emoticons are not necessarily easier to type than linguistic expressions. By the time the studies reported were conducted, many mobile phones already contained canned verbal expressions, as easily retrievable as emoticons. Picking an appropriate linguistic expression may seem more complex given the nuances of language, but choosing an emoticon can be almost as daunting, given the extensive range of alternatives at users' disposal (see Kato et al., 2007, Table 2, for 163 facial emoticons). Moreover, they are not always restricted to the face alone and can include culture-specific images such as *m(\_)\_m* (a bowing head; face level with the two *ms* representing the hands; eyes closed in contrition or gratitude), as well as those with the whole body such as *orz* (a person banging the head on the ground in frustration or desperation; *o* for the head, *r* for the arms, and *z* for the torso and legs).

We report data indicating that emoticons are used emphatically adding affect to explicit verbal content and imposing expectations on ensuing replies.

## 2 Study 1

We conducted a questionnaire to provide basic evidence for the effectiveness of emoticons uses.

### 2.1 Method

**Participants:** Sixteen native-Japanese students (9 female) at a national university in the Kanto area of Japan participated in the study for financial compensation based on on-campus rates for part-time work.

**Stimuli:** Twenty-four sets of messages were created. Participants were asked to rate how much each message expressed an emotion. Half of the messages described happy events (positive contexts), and the other half described upsetting events (negative contexts). The following is an example of a positive context with a smiley face at the end.

(1) この間面接に行った新しいバイト、無事に採用されたよ(^0^)

“The interview for the new part-time job, I got it without a problem [happy face].”

Each set contained four versions in a 2×2 within-participants design. The first factor was whether an emoticon or a full stop ended the message (see Kawakami, 2008, for judgements on different types of emoticons).

The second factor manipulated was the role that the participant was instructed to assume: as the sender or as the receiver of the message. We avoided using words and morphological endings that are stereotypically associated with one gender, so that both male and female participants could identify as the sender of any message.

**Procedure:** Each message was printed on a separate page within a frame depicting a mobile phone display. On top of the page a line of instruction indicated whether the participant was to assume the role of sender or receiver of the message. At the bottom of the page, participants rated how much the message expressed an emotion (e.g. for positive contexts: *yorokobi* “joy”, for negative contexts: *ikari* “anger”; 1 not at all; 7 very much).

The 24 sets of messages (each set containing the four versions of each message) were distributed into four lists according to a Latin Square design, so that each list contained exactly one version from each set, and equal numbers of positive events (e.g., as in (1)) and negative events, with and without emoticon. Each list was stapled in a block in pseudo-random order so that items in the same condition did not follow in succession. Each participant saw one list in a within-participants design.

**Analysis:** All analyses were conducted on R (R Core Team, 2016). Rating was treated as an ordered factor and analyses were conducted with random-effects ordered logit models (function *clmm*, package *ordinal*; Christensen, 2015; similar trends were obtained with analysis of variance). Random structure of the models was determined through backward selection. Pairwise comparisons were conducted using least-square means with *Tukey* adjustments (function *lsmeans*, package *lsmeans*; Lenth, 2016).

| Empathetic phrase | Emoticon received | Message received   |
|-------------------|-------------------|--|
| -                 | -                 | Oh. Was it at a cram school?   |
| <b>with</b>       | -                 | Oh. Was it at a cram school? <b>Great that you got it.</b>             |
| -                 | <b>with</b>       | Oh. Was it at a cram school? <b>[happy face]</b>                       |
| <b>with</b>       | <b>with</b>       | Oh. Was it at a cram school? <b>Great that you got it [happy face]</b> |

Table 1. Example of the four types of message received in Study 2.

## 2.2 Results and discussion

The factors included in the analysis were emoticon (with/without), role (sender/receiver), context (positive/negative) and all their interactions.

Overall, messages with emoticon elicited higher scores (mean 5.6) than messages without emoticon (4.4;  $\beta=2.24$ ,  $P<.001$ ), suggesting that emoticons help express emotions. This enhancing effect was larger in the positive contexts than in the negative contexts ( $\beta=1.42$ ,  $P=.001$ ; on emoticons being used more frequently in positive than negative contexts, see Derks, Bos and von Grumbkow, 2008; Park et al., 2013), but it was reliable in both types of contexts ( $P_s<.001$ ).

All other effects were not reliable ( $P_s>.1$ ). Previous reports indicate that participants tend to be egocentric and overestimate the effectiveness of their messages to express their intent such as sarcasm (Kruger et al., 2005). We failed to see such an effect in this study, perhaps because alternating between the role of sender and receiver made participants more sensitive to the effectiveness of the messages, or perhaps because we did not require the participants to type the messages they were supposed to send.

The results provide basic evidence that emoticons help express emotions. The following two studies build on this result to investigate emoticons in more detail.

## 3 Study 2

In this study, participants rated pairs of messages (a message sent and its reply) to determine how their reactions to the reply varied depending on the nature of the message sent. Moreover, we also manipulated the amount of verbal content to determine whether explicitly expressing empathy with words would cancel the effectiveness of emoticons.

## 3.1 Method

**Participants:** A new group of 28 native-Japanese students (11 female) from the same population as Study 1 were paid to participate in the study.

**Stimuli:** The 24 messages from Study 1 were used as *messages sent*, which participants were asked to assume they had sent to a friend. An item consisted of a message sent paired with the friend's reply (the *message received*). Each item had eight versions according to the following three factors in a  $2 \times 2 \times 2$  within-participants design. (See Table 1 for an example of the four types of message received in response to example (1).)

### (2) Factors in Study 2

- emoticon sent*: whether the message sent contained an emoticon;
- empathetic phrase*: whether the message received contained an empathetic phrase;
- emoticon received*: whether the message received included an emoticon.

The message received always contained a neutral expression that did not give away the friend's feelings (e.g., (3) as a response to (1)).

### (3) Neutral text in a message received without emoticon

おー。塾講だっけ。

“Oh. Was it at a cram school?”

An emoticon after (3) should have a clear effect following such a neutral expression, as it complements its meaning. But if emoticons only have decorative or utilitarian uses, in other words if they only have an effect when the words are ambiguous or insufficient to express an emotion, their effect should be neutralized by an overt expression of empathy and should have no effect

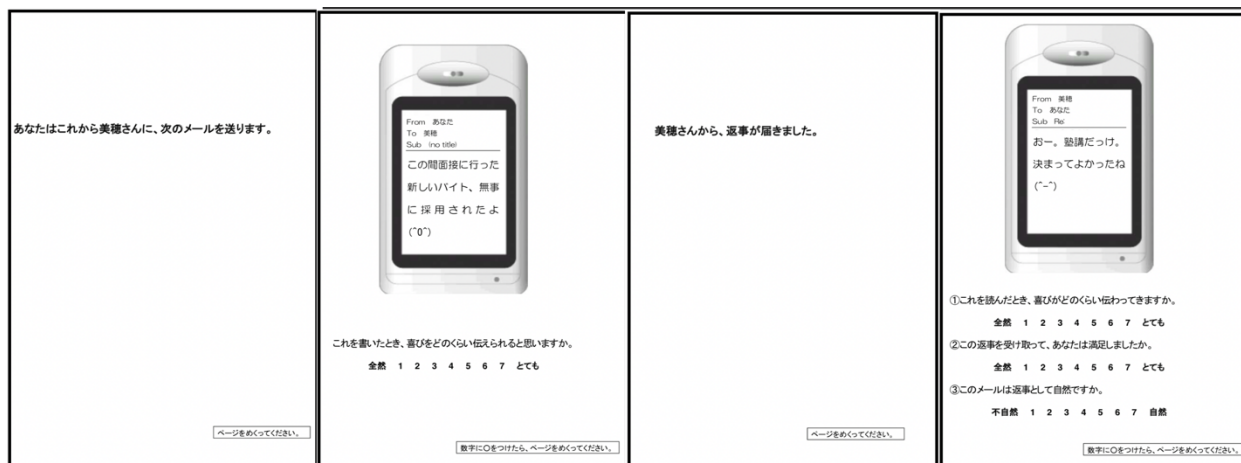


Figure 1. The four pages of an item in Study 2.

when following an explicitly empathetic phrase as in (4).

- (4) Empathetic phrase with emoticon  
 決まってよかったね(^-^)  
 “Great that you got it [happy face]”

But if emoticons can be used emphatically, they may add to the emotional content already expressed by the verbal message.

**Procedure and analysis:** Each item was printed on four successive pages containing a message sent and a message received (see Figure 1 for an example item with the message in (1) on page 2 and the messages in (3, 4) on page 4). On the first page, the participants were told that they were about to send a message to a friend. The second page had the message sent printed within the frame of a mobile phone and Question 1 at the bottom. On page 3, the participant was told that a response from the friend was being received. Page 4 had the message received and questions 2 to 4.

Participants were instructed to assume that the person they were interacting with was a friend. The name of the person appeared as the recipient on page 2 and as the sender on page 4. Common female names were used.

Participants answered four 7-point scale rating questions (‘1’ not at all, and ‘7’ very much). Question 1 was shown immediately after the message sent and asked how much this message conveyed a feeling (*yorokobi* “happiness” or *ikari* “anger”). The last three questions were shown immediately after the message received. Question

2 asked how much the message received expressed a feeling (same as in Question 1). Question 3 asked whether the message received was a satisfactory reply. Question 4 asked whether the message received was a natural reply.

The 24 sets of items (each set containing eight versions) were distributed into eight lists according to a Latin Square design, so that each list contained one version from each set and the same number of each version. Each list was stapled in a block in pseudo-random order so that items of the same type did not follow in succession. Each participant saw one list with 24 items.

Data analysis was conducted as in Study 1.

### 3.2 Results and discussion

Results were as follows.

**Question 1 (about the message sent):** replicated the results of Study 1. There was a main effect of emoticon as messages sent with emoticon (mean 5.93) were rated higher than those without emoticon (4.18;  $\beta=2.83$ ,  $P<.001$ ). There was also an interaction between context and emoticon as the emoticon effect was larger for positive than for negative contexts ( $\beta=1.37$ ,  $P=.017$ ).

**Question 2 (about the message received):** Results were as follows.

- (5)  
 a. *Emoticon sent.* Messages received were rated higher if they were replies to a message sent *without* an emoticon (mean 4.45) than if they were responses to a message sent *with* an emoticon (4.23;  $P<.001$ ). That is, sending a

message with an emoticon heightens the expectation for an empathetic response, leading judgements about the message received to be stricter.

Overall patterns indicated that emoticon sent did not interact with other factors. Moreover, type of context (positive or negative) only affected the effect sizes, but not their directions. Therefore, emoticon sent and context were not included in the remaining analyses reported.

- b. *Empathetic phrase.* Messages received with an empathetic phrase were rated higher (mean 4.93) than those without them (3.75;  $\beta=1.75$ ,  $P<.001$ ). This guarantees that the phrases used (e.g., (4) without the emoticon) were effective in expressing an empathetic response.
- c. *Emoticon received.* Messages received with an emoticon were rated higher (mean 5.03) than those without an emoticon (3.66;  $\beta=2.05$ ,  $P<.001$ ).
- d. *Emoticon received vs empathetic phrase.* Messages received with emoticon and without empathetic phrase (mean 4.62) were as effective as those without emoticon and with empathetic phrase (4.43), suggesting that emoticons were as effective as the empathetic phrases ( $P=.75$ ).
- e. *Emoticon received plus empathetic phrase.* There was an interaction between emoticon received and empathetic phrase ( $\beta=-1.17$ ,  $P<.001$ ) as the effect of the emoticon was smaller when there was an empathetic phrase (1.0) than when there was no such a phrase (1.74). This is unsurprising. What is more crucial is that although smaller the effect of the emoticon is reliable even when there is an empathetic phrase ( $P<.001$ ). In other words, the emoticon increases the empathy conveyed by the empathetic phrase.

The results to questions 3 and 4 revealed trends similar to those in question 2, therefore they are not reported.

The results suggest that already in 2010, when the ratings were collected, college-age native Japanese speakers were using emoticons to express emotional content and accepted them as much as short empathetic verbal phrases.

## 4 Study 3

The data for Study 2 was collected in 2010, therefore a new study was conducted in 2017 to replicate it by simulating exchanges in a messaging app commonly used in Japan these days.

Moreover, a concern in Study 2 is that the answer to Question 1 (about the message sent) may have affected the response to Question 2 (about the message received). Therefore, in this replication we asked one single question about each item: whether the reply expressed a given emotion (corresponding to Question 2 of Study 2).

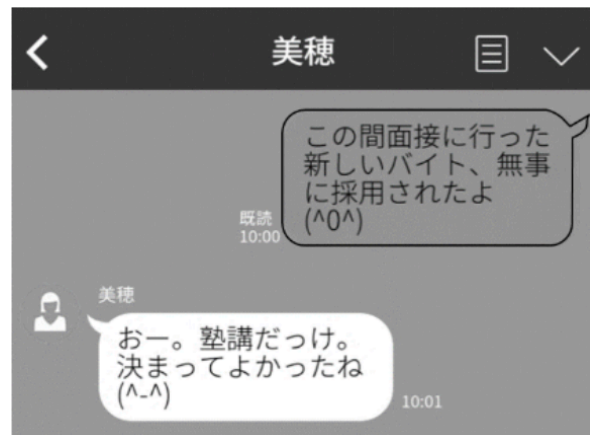


Figure 2. Example item of Study 3. The speech bubble on the top right is the message sent. The bottom left bubble is the friend's reply.

To prevent participants from going back to previous items, items were presented one a time on a computer screen using a modified version of Doug Rohde's Linger program (available from <http://tedlab.mit.edu/~dr/Linger/>).

### 4.1 Method

**Participants:** A new group of 40 participants (30 female) from the same population were paid to participate.

**Stimuli:** The messages and manipulations were the same as in Study 2, with some information updated (e.g., by removing the name of a rock band that had fallen out of favor). Figure 2 illustrates how the messages in examples (1, 3, 4) were presented as pictures (created using a freely available service at <http://www.mojimaru.com/talk> and simulated the appearance of a popular messaging app in Japan).

**Procedure and analysis:** Items were presented one a time on a computer screen in a different random order for each participant. Analyses were conducted in the same way as in Study 2.

**Results:** Trends replicated the results of Study 2 as summarized next.

- (6)
- a. *Emoticon sent.* Messages received were rated higher if they were responses to a message sent *without* an emoticon (mean 4.22) than if they were responses to a message sent *with* an emoticon (4.13;  $\beta = -.75$ ,  $P = .011$ ).
  - b. *Empathetic phrase.* Messages received with an empathetic phrase were rated higher (4.72) than those without them (3.62;  $\beta = 1.65$ ,  $P < .001$ ). This confirms that the phrases used (e.g., (3) without the emoticon) were effective in expressing an empathetic response in this study as well.
  - c. *Emoticon received.* Messages received with an emoticon were rated higher (mean 4.68) than those without an emoticon (3.67;  $\beta = 1.55$ ,  $P < .001$ ).
  - d. *Emoticon received vs empathetic phrase.* Messages received with emoticon and without empathetic phrase (mean 4.32) were as effective as those without emoticon but with empathetic phrase (4.40), suggesting that emoticons were as effective as the empathetic phrases ( $P = .98$ ).
  - e. *Emoticon received plus empathetic phrase.* There was an interaction between emoticon received and empathetic phrase ( $\beta = -1.06$ ,  $P < .001$ ) as the effect of the emoticon was smaller when there was an empathetic phrase (1.41) than when there was no such a phrase (1.50). Like in Study 2, the effect of the emoticon is reliable even when there is an empathetic phrase ( $P < .001$ ). In other words, the emoticon increases the empathy conveyed by the empathetic phrase in this study as well.

The results suggest that the ratings remained consistent despite the passage of time and the different types of media involved (email in Study 2, messaging app in Study 3).

## 5 General Discussion

Our findings can be summarized as follows.

- A. Sending an emoticon creates the expectation for an empathetic response (see (5a) and (6a)). But the response need not contain an emoticon. As long as it conveys empathy (through words or an emoticon), the response is rated as an acceptable reply to the initial message sent with an emoticon.
- B. Emoticons are judged to express an emotion (see (5c) and (6c)) and can be as expressive as a few empathetic words (see (5d) and (6d)).
- C. Even when the verbal message is unambiguous, emoticons can emphasize their emotional content (as in (5e) and (6e); see To, 2008, for similar trends).
- D. The role of emoticons has been stable between 2010 (when Study 2 was conducted with emoticons embedded in email exchanges) and 2017 (when Study 3 was conducted with the same stimuli simulating a messaging app).
- E. Emoticons are likely to be more acceptable in happy, positive events than in negative ones in line with previous reports (Derks, Bos and von Grumbkow, 2008; Park et al., 2013; *inter alia*).

In sum, emoticons are like emotion-expressing punctuation and have become a form of paralinguistic information akin to prosody (Asteroff, 1987, for an early discussion; also McCulloch, 2019, chapter 5, for a discussion on emoticons as gestures).

However, some caveats are in order. First, a possible concern in all three studies reported here is that the condition without emoticon always ended with a *maru* (the Japanese equivalent of a sentence-ending full stop). Recent reports suggest that full stops tend to be judged negatively in typed messages in English (Gunraj et al., 2016). Informal judgments suggest similar trends in Japanese college students. Therefore, in our studies, it is possible that at least part of the effect was caused by the negative effect of the full stop, rather than the expressiveness of the emoticons. This possibility requires further study, but some trends in the data suggest that the negative effect of full stops may not be enough to explain the results. For example, empathetic phrases without emoticon always ended with a full stop; nevertheless, they were rated favorably (see (5b,d) and (6b,d)). Moreover, the negative effect of full stops may be restricted to short messages (McCulloch, 2019,

chapter 4; preliminary results using the items in Study 3 tend to support this possibility).

Another concern is that previous work suggests that women use more emoticons than men (Tossell et al., 2012; and references therein). Preliminary analyses did not find gender differences, but this is also an area that merits more detailed analysis in the future. A factor that is likely to be relevant is that in our studies, the people who participants were asked to interact with always had female names, because we assumed it to be easier for participants to interact using emoticons with a female friend (see Fullwood et al., 2013, for a summary of results suggesting that males are more likely to use emoticons in mixed-sex environments).

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