

# The effects of enlarged words in text messages: Look clearer, but less premium

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**Abstract** This study explored the effects of enlarged words in text messages on receivers' affective judgment of the contents. In order empirically to investigate the effects, we conducted two experiments: One was a preliminary study to observe general user responses to enlarged text messages, and the other one was a survey to measure emotional responses of users when contexts of text messaging were specified. Based on the results, we revealed positive and negative aspects of using enlarging words as a nonverbal cue in text message communication.

**Keywords** *Computer-mediated communication, Text messaging, Font size, Enlarged words, User experience*

## Introduction

People use a lot of nonverbal cues in face-to-face conversation such as body movements, eye gazes, and vocal inflections in order to convey perceptual information. In computer-mediated communication (CMC), however, nonverbal aspects are not fully presented, especially in text-based channels (McKenna & Bargh, 2000).

Although the number of possible nonverbal cues are limited, people still have a desire to express their latent thoughts and impressions within text-based communications. Such desires have induced atypical uses of text messaging (Grinter & Eldridge, 2003; Tu, 2002). For instance, Kalman and Gergle (Kalman & Gergle, 2014) have found that letter repetitions often emulate nonverbal cues. Studies by Darics (Darics, 2013) and Tu (Tu, 2002) have also supported the non-standard use of texts as a means for nonverbal communication. In order to promote the nonverbal aspects of text-based communications, several approaches have been made. The study by Brumberger [3] has suggested typeface functions as a strong nonverbal cue that grants a personality to the texts. Bringing motion into texts was one of the most frequent approaches (Bodine & Pignol, 2003; Lee, Jun, Forlizzi, & Hudson, 2006; Yeo, 2008), and the results showed that kinetic typography enhances the emotional experience of users in text-based communications. Although these investigations have demonstrated the advantages of using nonverbal communication tools to deliver emotional information, such tools have not yet been widely used in real life due to their complexity and technical gaps.

In this regard, we focused on font size, which can be manipulated easily within current text-based communication channels. To the best of our knowledge, font size has not been examined as a nonverbal cue, even though its effects on readability

and usability have been studied frequently (Boyarski, Neuwirth, Forlizzi, & Regli, 1998; Darroch, Goodman, Brewster, & Gray, 2005). Hence, we investigated the effect of font size within the context of text messaging, which is one of the most prevailing forms of text-based communication.

In addition, rather than examining how senders use the font size as a nonverbal cue, we investigated how receivers perceive this cue. Earlier works related to nonverbal aspects in text messages have mainly focused on strategies of conveying emotional information from the perspective of senders (Hancock, Landrigan, & Silver, 2007; Lee et al., 2006). Since the nonverbal aspects have high possibility of being misinterpreted (Derks, Fischer, & Bos, 2008), it is significant to consider the perspective of receivers to explore the effects of font size on perceiving and interpreting text messages.

The goal of this study is to explore the possibilities of font size, and especially the use of enlarged words, as a nonverbal cue in text messaging. With this specification, we have following three aims: 1) To understand the comprehensive user experience in relation to the use of enlarged words within text messages, 2) To identify the influence of the context of the text messages (e.g. relationship of sender-receiver, contents of messages) upon the perception of enlarged words, and 3) To suggest design implications that summarize the perceptions of enlarged words in text messages. With these aims, we first performed a preliminary study to understand the comprehensive perceptions of users who received text messages. Based on this preliminary exploration, we proceeded to the main study, which investigates the influence of other factors on the perception of enlarged words. At last, we summarized the findings into design implications.

## Preliminary exploration

As stated previously, there is little information available on the emotional effects of enlarged words in text messages. Hence, we conducted an explorative study in order to understand the comprehensive user experience in relation to enlarged words. Six individuals were recruited for the study. They were graduate students who were studying interaction design and were familiar with using text messages. Firstly, we collected 60 chat rooms (10 chat rooms per person) that were recently activated from the messaging applications on each participant's smartphone (e.g. iMessage). From the samples, we selected 10 representative chat rooms, which were frequently appeared across different participants. Half of them were interactive dialogues with unfamiliar friends, a colleague or a family member. The other half consists of a streamline of notice messages from a restaurant, an online shopping mall, or service providers.

Two of researchers who were studying interaction design modified the text chats by enlarging 1 to 3 words of a message within a chat. They selected words which reflect the major atmosphere or the main topic of the text chats. Once the words to be enlarged were decided, we made iterative trials to identify the font size of enlarged words. Through these trials, the font size for the enlarged words was set at twice the size of the normal text. This provided an apparent contrast between the two without compromising the legibility (Figure 1).

We presented the 10 pairs of text chats to each participant as images of 750x1334 resolution and conducted a semi-structured interview with these stimuli. During the interview sessions, we mainly focused on the feelings and needs of receivers in relation to the enlarged words. Participants were asked to verbalize how they felt about the text messages with enlarged words in comparison with the normal ones. They were then asked to spell out the words that needed to be enlarged from their perspective as receivers. We made a note of the verbal descriptions and analyzed the notes by classifying the nouns and adjectives that participants had utilized. The results provided two insights regarding the perceptions of enlarged words within text messages.

### *Enlarged words evoke emotional responses beyond the contents of messages*

We collected descriptions that participants used to express their feelings and thoughts about enlarged words. Many of them were related to affective and emotional responses. For instance, one participant described an enlarged word as an "emoji" and stated that "it looks like it's speaking out loud". Another participant mentioned that the contents sounded "reliable" when the due date (e.g. January 29) of medical examination notice was enlarged. Contrary to these positive responses, the enlarged words sometimes evoke negative emotions. When the amount of money was enlarged within a conversation between friends, participants often perceive it as heartless. Overall, participants felt that there was a reason that certain words were selectively enlarged within a

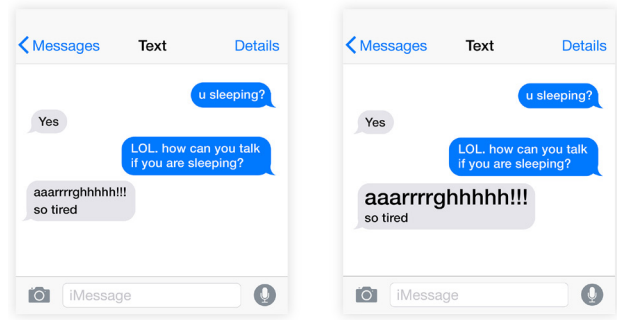


Figure 1. Comparison of normal-sized words and an enlarged word in text messages.

message, and tried to identify the intention of the sender. This process frequently evoked emotional responses beyond the written contents of the text messages.

### *Emphasize information, enhance emotion*

In relation to the needs of enlarged words as a receiver, two distinctive perspectives emerged. One perspective was related to the emphasis of key information provided in a message. For instance, the due date of a health checkup and the license number of a vehicle were often mentioned. In these cases, participants wanted to grasp the important information quickly and efficiently (e.g. "I can see the essential part of the texts at a glance"). The other perspective was about the degree of perceived emotion. Particularly in apologetic and appreciative contexts, participants frequently associated the enlarged word with the sincerity of emotion (e.g. "I feel that the emotion [of the sender] is emphasized"). This indicates that receivers may expect that senders are expressing their attitudes and emotions by enlarging particular words.

## Main study

Through the preliminary exploration, we found that both positive and negative emotions can be raised by enlarging certain words. We also identified that people wanted to enlarge different words depending on the main theme of the chats. In order to investigate the effect of enlarged words in specific contexts and how such enlarged words are perceived, we conducted a main study as described below.

### *Experimental Design*

#### *Independent variables*

We set three independent variables with two levels for each: Size of Word, Type of Communication, and Contents of the Enlarged Word. Figure 2 illustrates the experimental design with examples of text messages.

- Size of Word. This variable is fundamental for investigating the general effect of 1) Enlarged words in text messages as compared to 2) Normal-sized text messages. We maintained the same conditions for font sizes and screen resolution that were used in the preliminary study.
- Type of Communication. The text chats collected from the participants of preliminary study were

		Contents of Enlarged Words			
		Emotion	Information	Emotion	Information
Size of Word	Normal	aaarrrrghhhh!!! so tired	student card or credit card?	... appreciated if you get your...	... due date : January 29
	Enlarged	<b>aaarrrrghhhh!!!</b> so tired	<b>student</b> card or <b>credit</b> card?	<b>... appreciated</b> if you get your...	<b>... due date</b> : <b>January 29</b>
		Two-way (usually in dialogue)		One-way (usually in notice)	
		Type of Communication			

Figure 2. Experimental design of the main study with examples of text messages.

divided into two categories regarding their text chat type. One type of chat was 1) A two-way communication (usually in dialogue) that consisted of an interactive conversation between people, and the other was 2) A one-way communication (usually in notice) such as an announcement or an advertisement.

- Contents of Enlarged Word. Reflecting the needs of receivers that were revealed in the preliminary study, we investigated the effects of the content that enlarged words delivered. We made two variations for each message: one variation enlarged words that expressed 1) Emotion, and the other enlarged words that expressed 2) Information.

In order to examine the effects of the *Size of Word*, pairwise comparison was used to compare the perceptions of enlarged words against those of the normal messages. For examining the effects of the *Type of Communication* and the *Contents of Enlarged Words*, we devised a 2x2 within group design. We prepared three different text chats for each of Two-way (dialogue) and One-way (notice) communication. After enlarging words with different

contents in each chat we had a total of 12 stimuli (Table 1).

#### Dependent variables

The preliminary exploration revealed that people make affective judgments on the enlarged words beyond the given contents of text chats. In order to measure the degree of emotions evoked by enlarging certain words, we decided to use 13 adjectives that convey positive emotions. The 13 adjectives were originated from two sources. One source was AttrakDiff (Hassenzahl, Burmester, & Koller, 2003), which is a widely validated tool for evaluating user experience, and we selected 7 adjectives from the tool - *Attractive, Clear, Human, Inventive, Premium, Professional, Simple* - that seemed to be matched with the context in which the text message was received. The other source was the emotional terms that were collected during the preliminary study. We chose six adjectives - *Careful, Familiar, Young, Natural, Practical, Reliable* -, which provided interesting descriptions about the latent meanings of enlarged words. Using these 13 adjectives, we made a survey question for each stimuli. Figure 3 shows a sample of survey question to rates the relative attractiveness of enlarged words within a notice

Table 1. Summary of 12 stimuli used in the main study.

Type of Communication	Relationship	Contents of enlarged words	Enlarged words within a message (typed in bold)
Two-way (usually in dialogue)	Close friends	Emotion	<b>AHHH!!</b> So tired
		Information	<b>ID</b> card or <b>Credit</b> card?
	Couple	Emotion	love u <b>MORE~</b>
		Information	See you after <b>Three Days~!</b>
	Family	Emotion	<b>Thank you</b> so much!! mum
		Information	Just give me <b>\$5</b>
One-way (usually in notice)	Hospital — customer	Emotion	<b>We will be appreciated</b> if you get your health checkup as soon as possible
		Information	Sign up Due date for Health Checkup: <b>January 29</b>
	Restaurant — customer	Emotion	<b>We hope you will win</b> the great prize of this event!
		Information	(...) great chance to get a <b>New Laptop and a New Smartphone</b>
	Call-Taxi service — customer	Emotion	<b>Thank you</b> for using our service
		Information	Your HanbitCall ride will arrive soon. <b>Car Number : 5870</b>

message from a hospital.

### Procedure

We recruited 32 graduate and undergraduate students who were familiar with text messaging (15 males and 17 females, 24.94 years old on average). We showed participants 12 pairs of text chats one by one and asked them to rate the relative scores of enlarged words compared to the normal ones using 13 different adjectives. Accordingly, each participant answered a total of 156 questions (12 pairs x 13 adjectives). Ratings were measured using a 5-point Likert scale from “not at all (-2)” to “very much (+2)”. Since all of 13 adjectives convey positive emotions, the negative ratings indicated that enlarged words had a bad influence upon the perception of receivers.

### Results of the main study

We devised two statistical methods to analyze the data, a one-sample t-test and a within-group two-way ANOVA. A one-sample t-test was conducted to compare the ratings of 13 enlarged words from four different contexts (52 cases) with the normal-sized text messages, which were regarded as having a rating of 0. A within-group two-way ANOVA was conducted to examine the effects of the *Type of Communication* and the *Contents of Enlarged Words*.

#### Effects of size of word in general

As shown in Table 2, the results of the one-sample t-test showed that there were significant differences in ratings in 31 cases out of 52 ( $p < .05$ ). Among 31 cases, 22 enlarged words received higher ratings than normal-sized ones, which indicate positive responses, while 9 cases received lower ratings, which indicate negative responses. Interestingly, the uses of enlarged words were perceived *less Premium* but *Clearer* regardless of its context. Except these two emotional terms, the effects of enlarged words vary depending on the combinations of *Type of Communication* and the *Contents of Enlarged Words*. In order to investigate the effects of these factors in more detail, we proceeded to the next analysis.

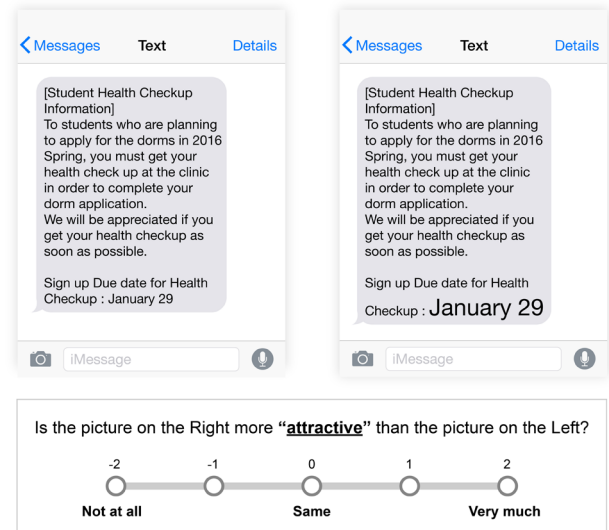


Figure 3. Sample of survey question.

#### Effects of size of word depending on contexts

Table 2 summarizes the results of two-way ANOVA. It showed that the *Type of Communication* only had effects on the perception of 5 adjectives, while the *Contents of Enlarged Words* had effects on 12 adjectives out of 13. This indicates that the *Contents of Enlarged Words* have a broader influence on the affective judgment of receivers than the *Type of Chat*. Participants made more discrete judgments depending on whether emotional words are enlarged or informational words are enlarged than whether the text chat is a two-way(dialogue) or a one-way(notice).

For instance, the degree of *Humaneness* was significantly higher when emotional words were enlarged in both dialogues and notices. In contrast, the degree of *Practicality* and *Reliability* were significantly higher when informational words were enlarged in both dialogues and notices. These three adjectives were examples of emotions that mainly

Table 2. Mean differences between enlarged words and normal-sized ones.

\* Statistically significant results ( $p < .05$ )

Dependent variables	Dialogue-Emotion	Notice-Emotion	Dialogue-Information	Notice-Information
Attractive	0.74*	0.20	-0.14	0.46
Careful	-0.43*	-0.41*	-0.01	0.18
Clear	0.72*	0.30*	1.00*	1.22*
Familiar	0.79*	0.23	-0.02	0.18
Humane	1.02*	0.59*	-0.09	0.16
Inventive	0.53*	-0.07	0.11	0.30*
Natural	0.64*	0.05	-0.19	0.35*
Practical	0.32*	0.07	0.79*	1.18*
Premium	-0.89*	-0.81*	-0.78*	-0.41*
Professional	-0.65*	-0.62*	-0.26	0.27*
Reliable	-0.02	-0.25*	0.24*	0.57*
Simple	0.26	0.24	0.51*	1.00*
Young	0.78*	-0.01	-0.09	-0.09

affected by *Contents of Enlarged Words*.

Beyond the main effects of the *Type of Communication* and the *Contents of Enlarged Words*, interesting interaction effects were observed upon the perception of 12 of the 13 adjectives. This indicates that people perceived differently depending on which contents were enlarged in which type of text chat. To be specific, participants perceived the enlarged emotional words in dialogues and enlarged informational words in notices more *Attractive, Inventive, and Natural*.

### Implications for practice

The results of preliminary and main studies shown that using enlarged words in text messages can be used as a nonverbal cue that evokes affective judgments. Depending on context, however, the perception of receivers could be both positive and negative. In this regard, we summarized the findings in order to make them applicable in practical fields such as instant messenger applications, automatic text-based announcement systems, viral marketing, and so on. Figure 4 shows the summary of findings graphically.

#### Using enlarged words in dialogues (Q1, Q4)

Compared to the notice-type chats, using enlarged words in dialogues has more advantages. Even in dialogues, however, the messages could be perceived differently depending on the contents of the enlarged words. Hence, the use of enlarged words in dialogues should be considered carefully depending on the aim of the message. For example, enlarging the emotional words can help to make the message appear more humane and attractive, even if it may look careless and unprofessional (Q1). By contrast, enlarging informational words can help to make the message appear more practical and reliable (Q4). Recently, increasing numbers of IoT systems ("Introducing LG HomeChat,") are devising dialogue-type communications as a way of controlling devices. In such applications, the user experience could be enhanced by enlarging appropriate words depending on the purpose of communication.

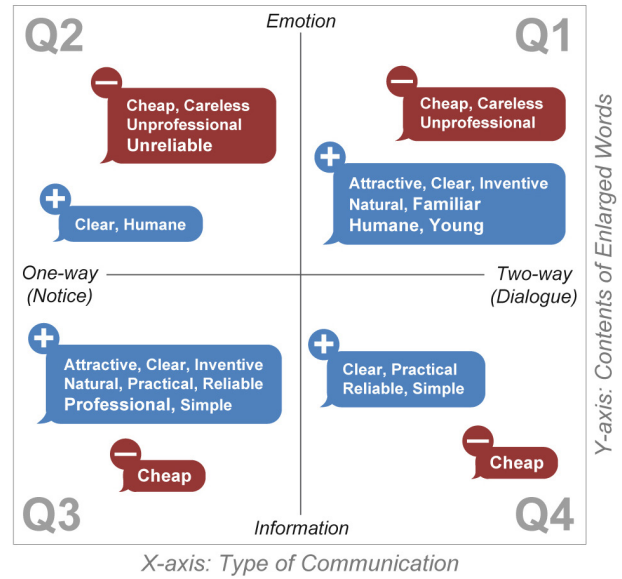


Figure 4. Positive and negative effects of using enlarged words depending on contexts.

#### Using enlarged words in notices (Q2, Q3)

In the meantime, use of text messages to send advertisements and announcements is common, and such text messages mainly focus on conveying information rather than emotions. In this manner, the positive effects revealed in Q3 supports the effective use of enlarged words in notices sent via text-based communications. For example, the attractiveness and reliability of notice messages can be improved by enlarging the information to be delivered. However, enlarging the emotional words in notices may damage the sincerity and genuineness of the message, especially when it expresses emotions such as appreciation and apology (Q2).

### Conclusion

In this paper, we have investigated how enlarged words affect to the emotional interpretation of text

Table 3. Results of two-way ANOVA test. \* Statistically significant results ( $p < .05$ )

Dependent variables	Main effect of Type of Communication	Main effect of Contents of Enlarged Words	Interaction effect
Attractive	F(1,31) = 0.05	F(1,31) = 5.03*	F(1,31) = 30.90*
Careful	F(1,31) = 1.52	F(1,31) = 35.06*	F(1,31) = 1.18*
Clear	F(1,31) = 1.65	F(1,31) = 24.15*	F(1,31) = 7.71*
Familiar	F(1,31) = 3.53	F(1,31) = 11.88*	F(1,31) = 17.68*
Humane	F(1,31) = 0.87	F(1,31) = 35.96*	F(1,31) = 14.46*
Inventive	F(1,31) = 6.31*	F(1,31) = 0.04	F(1,31) = 28.58*
Natural	F(1,31) = 0.05	F(1,31) = 5.01*	F(1,31) = 19.11*
Practical	F(1,31) = 0.51	F(1,31) = 55.08*	F(1,31) = 6.43*
Premium	F(1,31) = 8.61*	F(1,31) = 7.97*	F(1,31) = 6.98*
Professional	F(1,31) = 8.61*	F(1,31) = 44.36*	F(1,31) = 8.79*
Reliable	F(1,31) = 0.41	F(1,31) = 28.98*	F(1,31) = 11.28*
Simple	F(1,31) = 11.37*	F(1,31) = 24.42*	F(1,31) = 4.64*
Young	F(1,31) = 8.74*	F(1,31) = 13.16*	F(1,31) = 23.15*

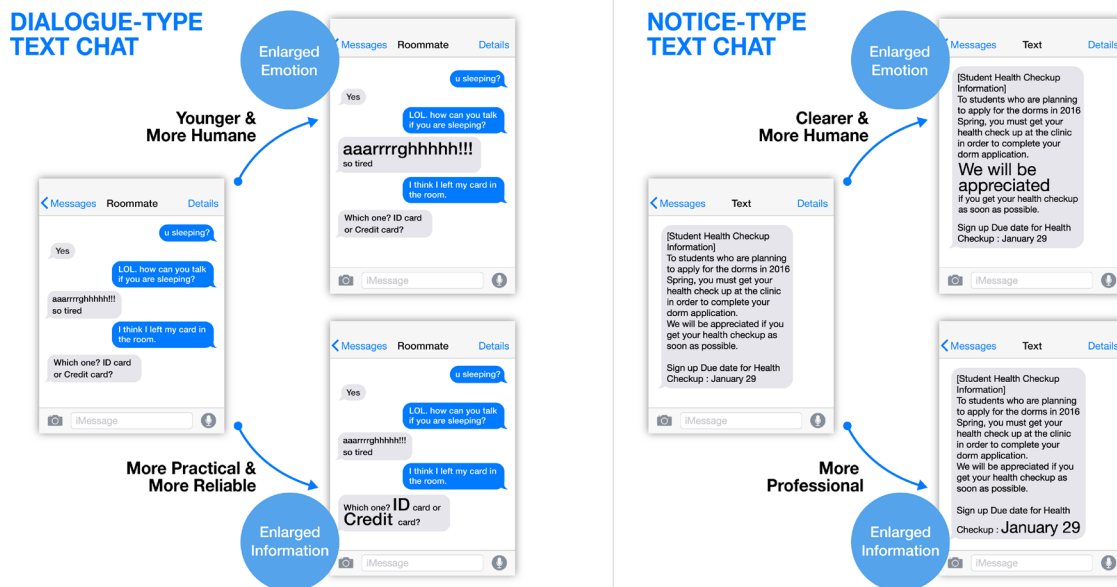


Figure 5. Positive effects of using enlarged words with exemplar cases.

messages. In the preliminary study we examined the possibilities of enlarging words to emphasize information and enhance emotions beyond the contents of text messages. Our findings indicate that enlarged words in text messages evoke emotional responses, and such response can be both positive and negative depending on the *Type of Communication* and the *Contents of Enlarged Words*. Figure 5 shows the examples of enlarged words in specific contexts that illustrates the positive and distinctive effects for each case. Although each context has benefits, enlarged emotions in dialogue and enlarged information in notice have greater advantages in perceptions of receivers. These findings may enhance the nonverbal aspects of text-based communications in various fields such as instant messengers, automatic text announcements, and so on. In conclusion, the first contribution of the study is to explore the possibility of using the enlarged word in various text message contexts to enrich the text-based communication. The second contribution is to provide new design opportunities of using the enlarged word in text messages for interaction designers and design researchers.

In our future work, we plan to study the intentions of using enlarged words in text-based communication, so that we may provide implications for using enlarged words as a nonverbal cue in text-based communication.

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