Know What I Mean?

Perception of Emotional Content in Email, Notes, and Text Messages

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Abstract

Technological innovations have promoted new modes of communication that have marked benefits (e.g., speed), but also some potential costs. For example, research suggests that emotional connotation can be affected by mode of communication. In this study participants read positive, negative, and neutral messages that were presented as text messages, emails, and handwritten notes. They were asked to reply to the message and then rate their emotional experience of the message as well as the appropriateness of the mode of communication. Results indicate differences in perception of emotion and format. Text messages were rated as more appropriate than email and notes. Limitations to the study and future research are discussed.

Know What I Mean? Perception of Emotional Content in Email, Notes, and Text Messages

Technology has become a necessity in our daily lives. In 2000, 51% of US families had a computer at home, with 42% having internet access at the home (U.S Census Bureau, 2009). By 2009, approximately 70% of all homes were estimated to have internet access (U.S Census Bureau). One of the uses for computers in the home is communication. Computer-mediated communication (CMC) began in the early 1990s, and has continued to influence society to this day.

With technology at our fingertips, CMC can take many forms: text-messaging, chat rooms, blogs, and e-mail. Even though CMC can take many forms, there are differences between character limitations, time sequences, and the technology used to present the message (i.e. cell phone, computer, etc). For example, text messages have a character limitation per message, so people may feel more inclined to shorten the message using abbreviations and include fewer details. Compared to an e-mail message, where there are no character restraints, people have the opportunity to expand their message and go into more depth. The differences in time sequences comparing text-message and e-mail, is that text-messages are usually sequential and happen at a much faster pace, then an e-mail which there may be a longer time frame before the message can get a response. CMC is also drastically different from traditional face-to-face (F2F) communication. Face-to-face communication includes body movements, voice pitch, facial expressions, and word emphasis. CMC lacks these nonverbal cues; considering this, it has been questioned as to whether emotion can be communicated effectively in CMC (Derks, Fishcer, & Bos, 2007).

Derks et al. (2007) conducted a literary investigation into this question. They examined previous research on the expression of emotion in CMC to support or deny the effective

communication of emotion in CMC. Derks et al.'s findings suggest that positive emotions are expressed the same in CMC as in F2F, while negative emotions are expressed more overtly in CMC, than in F2F. One suggestion as to why negative emotions are expressed more openly is the fact that the presence or absence of other people affects the way we regulate our emotions in F2F interactions. When one is around strangers, then they tend to show less emotion, than with friends, in which they show more emotion. CMC reduces the negative social consequences for expressing emotions in public, especially to strangers. We now understand that emotion can be communicated effectively in CMC, but does the activity of the person in a virtual environment have to match the expressed emotion?

When judging a person's emotion, their activity must also be congruent with their words, especially in a computer environment where nonverbal cues are not present. For example, a person who is exhibiting a positive emotion may have more flexible activity in a virtual environment, compared to someone who is exhibiting a negative emotion, whose actions are expected to be resolute and unwilling to cooperate with others in a virtual environment. Cheshin, Rafaeli, and Bos (2011) had investigated whether two basic emotions, anger and happiness, can be detected by others, and if it can influence others' emotions(e.g. emotion contagion). Emotion contagion indicates the strength of the emotion transmitted; for example, the emitted emotion is so intense that it effects others around them. In the study, confederates communicate as being either angry or happy. The activity of one who is angry is more likely to be resolute, or stubborn. The actions of one who is happy is more likely to be flexible or open. When these actions are incongruent to the perceived emotion (i.e. someone emitting an angry emotion, but having flexible actions) would result in confusion for the receiver. This confusion would lead to a negative effect on the receivers. The results for this study indicated that emotion

can be detected accurately in CMC, and that contagion of emotion is possible. When the emotion

of the words was not congruent with the actions, there was a negative effect on the receivers.

This was a result of the frustration and confusion of the incongruent actions and emotion.

Therefore, virtual actions must match the expressed emotion to avoid confusion.

Considering that receivers use both emotion words and actions of the senders to

determine the sender's emotions, what factors are used by the senders to express a given

emotion? Hancock, Landrigan, and Silver (2007) had conducted a study to determine these

factors by setting up groups of two people, where one of the participants was an expresser of an

emotion, and the other was a naive partner, who was only told to communicate with the other

person. The expresser was assigned to either express a positive, or negative emotion, but was

instructed not to explicitly say their emotion. Hancock et al. found that there are four methods for

differentiating between positive and negative emotions. First, is the number of times in which the

expresser agreed with their partner. It is not the point to which they agreed, but actually the

degree to which they disagreed that is the determining factor. Second was how many negative

affect terms were used. Negative expressers uses more negative affect terms than the positive

expressers. Third, was the increase use of punctuation, especially the increase in exclamation

points for the positive emotion. Fourth, was the speed of response, along with the amount of

content. Positive expressers responded more quickly than the negative expressers as a way to

express emotion, but the determining factors was actually that positive expressers use more

words than the negative expressers (Hancock et al., 2007). These were the strategies used by the

expressers to give off an intended emotion. The expressers rated themselves as giving off the

accurate emotion, and the receivers were easily able to detect the correct emotion without

difficulty. Harris and Paradice (2007) had conducted a similar study to Hancock et al., but

instead examined the strategies used by *receivers* to detect emotion. Their participants were given both a randomly selected positive and negative e-mail message. Participants were then asked the sender's intended emotion and the strength of that emotion. If the emotion was detected correctly, the participants were asked to indicate how they were able to detect it, given the following choices: message content, certain emotion words, indirect phrases, other cues such as punctuation. According to this study, the factors which aid the receiver in detecting the emotion of the message were linguistic cues, emotional cues, and the actual words used. Previous studies had only looked at the detection of emotion among CMC and F2F, but never CMC to other text-based forms of communication.

Since CMC is text-based, is there a difference in the expression of emotion between computer-based text and handwritten text? Naquin, Belkin, and Kurtzberg (2010) explored lying rates and justification of behavior in e-mail compared to pen and paper. Naquin et al. found that people lied more in the e-mail condition than in the pen and paper condition, and that participants in the e-mail condition felt more justified to lie than the pen and paper condition. One explanation for this is that people feel less attached to their words in the electronic medium, than in the pen and paper medium. This is true even though it is harder to get rid of the electronic message once it has been sent than the paper message. This absence of attachment may have to do with the permanence of the words; for example, it is easier to delete words on a computer with the touch of a button, than in pen and paper. This can lead to the writer not feeling ownership of their words. The fact that people feel less attached to their words in the electronic medium, could have an effect on the emotion perceived by the receiver. Does the receiver take into consideration the permanence of the medium being presented to them, and does the receiver detect the same emotion in the electronic medium, than the handwritten medium?

The purpose of our study is to determine if the mode of presentation (text-messages, e-mail, and notes) has any effect on emotion perception. We will also be looking as to whether the mode of presentation is appropriate for certain emotional messages. Since text messages have a constraint on the number of characters used, the handwritten messages were kept to short notes, also for the fact that people do not seem to want to write as much, as when something is typed on a computer keyboard. It is possible that emotion may be detected as more intense in the handwritten notes, since people seem to feel attachment to their words. Emotion may be interpreted as being less intense in the text-messages, since words may be abbreviated for the character constraints, and that text-messages are very short instantaneous messages. To our knowledge, this is the first study to examine the detection of emotion in text-based media of e-mail, text messages, and handwritten notes.

Methods

Participants

Twenty Missouri Western State University students (17 female) participated in the experiment for credit in a psychology course. The average age of the participants was 21. All of these participants reported having a cell phone, and 95% say they have unlimited texting. Sixty percent of participants reported that they check their cell phone for text messages hourly. Most participants (65%) checked email daily and 45% said that they do not like writing notes.

Materials

A demographic survey was created; it asked questions regarding demographic information and use of text-messaging, e-mail, and notes. The survey also asked participants' opinions about each mode of communication, for example, why they like or dislike certain mediums and what type of person they believed would use each medium.

Messages with positive, negative, and neutral context were also created. This was done by looking through past text messages and e-mails to see what was typical for a message in terms of length, format, and topic. We then came up with 39 topics and composed a text, email and note for each. Each message contained the same general topic and perceived emotion across the three mediums. The exact wording of the messages varied by format in order to keep stimuli more realistic. For instance, e-mail messages contained more words, fewer emoticons, and a salutation, whereas text messages rarely included a salutation and were more likely to contain emoticons. When two or more messages were too similar (e.g., more than one message about cleaning the bathroom), the topic was changed or the message was deleted so there was only one remaining. At the end of this process, we had three message formats for each of the 39 topics producing 117 total messages. Three lists were created to counterbalance topic presentation across message formats – one topic would be shown as a text-message in one list, as an e-mail in another, and as a note in the other. Presentation was blocked by message type, so that participants received on of the following orders: 1) E-mail, Note, Text; 2) Note, Text, E-mail; or 3) Text, E-mail, Note.

In order to quantify participants' experience, we created a five-item assessment that was completed for each message (see Appendix). The items asked participants to rate the emotion they felt from the messages, the intensity of the emotion they felt, the appropriateness of the message, and what their preferred mode of communication (e-mail, text-message, note) would be for that type of message.

Several pieces of equipment were used in this experiment. The participant was located at a desktop computer in the experiment room. Another computer was used outside the study room by the experimenter to send the messages. One cell phone with a QWERTY keyboard was used

by the participant. A 3-ring binder contained the messages on sticky notes, stuck to blank pages, so that there was only one note per page.

Procedure

Upon arrival, we obtained informed consent then had participants complete the demographic survey. After that participants would begin receiving messages in one of the mediums. They were asked to first respond to the message then answer the five-item assessment. Depending on their assigned condition (Version 1, 2, or 3) they would begin with text-messages, e-mails, or notes. The experimenter and the participants were in separate rooms with a closed door so that they would not see each other when the messages were being sent.

Participants responded to each message; *after* responding to each message they would complete the five-item assessment then proceed to the next message. Text messages were sent from a Hotmail e-mail account to a phone that was used by the cell phone. Two separate Hotmail e-mail accounts were used for the e-mail condition. One was the experimenter e-mail (the same as the one used for sending text-messages); the other was a participant e-mail account (set up and maintained by the researcher, not the participant's personal account). The messages were already in the inbox when the participants arrived; they were also numbered so participants would know which order to respond to them in. For the notes, we had a binder containing pages; each page had one sticky note on it that contained one message. Participants were asked to respond to each message by writing a response on a blank sticky note and sticking that note on the page containing the original message. After the experiment was over, the participants were debriefed on the purpose of the experiment.

Results

All participant responses to the five-item assessment were transformed into proportions. Although twenty-three participants began the experiment, three did not complete the entire session, thus their data was excluded from the results. An alpha level of .05 was used to determine whether a result was statistically significant.

Three 3 (emotionality – positive, negative, neutral) X 3 (message format – note, email, text message) within subjects, repeated-measures ANOVAs were conducted for participant responses to Item 1- *How do you feel emotionally, about this message?* Participants could classify the message as being *generally positive*, *generally neutral*, or *generally negative*.

First, we examined messages (proportions of negative, positive, and neutral messages in each of the three formats) that participants rated as being generally positive. There was a significant main effect of emotion, $F (2, 18) = 44.8$, $p < .001$. Post hoc analyses indicated that all of the emotions - positive, negative and neutral – were significantly different from each other. Positive messages ($M = .60$) were most likely to be rated as positive, neutral messages less so ($M = .33$), and negative messages ($M = .03$) were the least likely to be rated as positive.

When the proportions of trials rated as neutral were examined there was a significant main effect of format, $F (2, 18) = 4.8$, $p = .021$. Post hoc analyses indicated that all of the formats- note, email, and text messages- were significantly different from each other. Text messages ($M = .46$) were most likely to be rated as neutral, emails ($M = .44$) less so, and notes ($M = .34$) were the least likely to be rated as neutral. There was also a significant main effect of emotion, $F (2, 18) = 3.77$, $p < .001$. Post hoc analyses indicated that responses to all of the emotion conditions were significantly different from each other. Neutral messages ($M = .63$) were most likely to be rated as neutral, positive messages less so ($M = .35$), and negative messages ($M = .27$) were the least likely to be rated as neutral.

Finally, when proportions of trials rated as negative were examined, there was a significant main effect of format F (2, 18) = 5.9, p = .011 (see Figure 1). Post hoc analyses indicated that notes (M = .32) were more likely to be rated negative with email (M = .27) being less so, and text (M = .21) were the least likely to be rated as negative. There was a significant main effect of emotion, F (2, 18) = 69.5, p < .001. Post hoc analyses indicated that negative messages were more likely to be rated as negative (M = .70), than neutral (M = .04), or positive (M = .05). There was a significant interaction between format and emotion, F (4, 16) = 5.2, p = .007. This significant effect indicates that negative emails and notes were more likely to be rated as negative than were negative text messages.

A 3 X 3 within-subjects, repeated-measures ANOVA's were conducted for participant responses to Survey Item 2 - *On the scale below, rate the intensity of the emotion the message made you feel*. Participants could rate the item as *1 – little to no intensity*, *2 – slight intensity*, *3 – moderate intensity*, or *4 – strong intensity*. There was a significant main effect of emotion, F (2, 18) = 45.0, *p <.001*. All conditions were significantly different from each other. Post-hoc analyses indicated that negative messages were rated as being most intense (M = 2.85), followed by positive messages (M = 2.35), while neutral messages (M = 1.79) were rated as least intense.

A 3 X 3 within-subjects, repeated measures ANOVA was conducted for participant responses to Survey Item 3 - *On the scale below, how appropriate was it to receive this message in the format it was sent to you* (results are shown in Figure 2). Participants could rate the items as *1 - not at all appropriate*, *2 – slightly appropriate*, *3 – moderately appropriate*, and *4 – very appropriate*. There was a significant main effect of format. F (2, 18) = 16.3 p < .001. Post-hoc analysis indicated that text messages (M = 3.1) were rated as being more appropriate than emails (M = 2.4) or notes (M = 2.3). There was a main effect of emotion on ratings of appropriateness, F

(2, 18) = 10.8, *p* = .001. Post-hoc analyses indicate that negative messages were viewed as being less appropriate (*M* = 2.2) than positive (*M* = 2.8) or neutral messages (*M* = 2.8).

Discussion

We found several different interactions in perceived emotion and the format of the message. Neutral messages were more likely to be rated as neutral in a text message than in notes and emails. Negative messages were rated as less negative in text messages than in notes and emails. This implies that perhaps emotion is attenuated in text messages compared to other formats. Negative messages were most likely to be rated as most intense, compared to positive and neutral messages. This means that we react more strongly to negative messages than positive messages. Negative messages were rated as the least appropriate in all three of the mediums. In addition, across the three mediums, text messages were rated as a more appropriate form of communication than notes or emails. Therefore, we found that emotional perception is affected by the medium of which the message is presented.

There are several reasons as to why we found these differences in emotional perception and format of the message. One possibility is that people feel less attachment to their words in different mediums. Naquin, Belkin, and Kurtzberg (2010) found this result in their study of lying rates in email and notes. They found that in electronic mediums, people felt less attachment to their words. This may be related to the permanence of the words. This might give an explanation as to why neutral messages were rated as neutral in text messages more than in email and notes, and why negative texts are less likely to be rated as negative compared to email and notes. Text message have a less feeling of permanence in conducting and sending of the messages. Text messages are sent and received so quickly that people may not feel very much attachment to the words they just sent. Because of character limitations on text messages (e.g., 160 characters),

people attempt to convey their message in the least amount of words with less detail. Since text messages are very short messages, and are perceived as less permanent, it seems very reasonable as they would be seen as less emotion-laiden than other mediums.

The same explanation can be given for why negative messages were seen as less negative in text messages than in email and notes. The receivers may have perceived the negative messages as less negative in text messages because they took in to consideration the permanence of the medium. Emails and notes may have been perceived as more emotionally negative because the sender had to take the time to sit down and think about their words, and either type of write out the negative message. Emails did not have character limitations as the text messages did, so the sender has the opportunity to expand on the subject, making the message seem more negative. Notes did have character limitations since they were written on small sticky notes. Notes were probably perceived as more negative because the sender had to take the time to write out the message, giving the sender more attachment to their words. The receiver may have unconsciously thought that the sender had more attachment to their words since they took the time to handwrite the messages, thereby giving off a more negative emotion. Therefore, the receiver may have perceived the text messages as less negative because they felt that it was a less permanent medium, giving the sender less attachment to the words they sent.

Even though text messages were perceived as having less emotion than notes or emails, they were rated as being the most appropriate medium. One explanation for this is that text messages are sequential and happen at a much faster pace. Because cell phones offer a much more rapid response, they are seen as being more appropriate than email or notes. In email and notes there is a delay in response and a certain place on must be to interpret the message. For

emails, one must be at a computer to check and respond to their email. For notes, one must be in the location of the note.

Another explanation as to by text messages were seen as more appropriate than notes and email may also have to do with our sample. We had 20 participants (17 females), with an average age of 21 years. All of our participants reported owning a cell phone, and 95% of them reported having unlimited text messaging. Over half (60%) of our participants also reported checking their cell phone hourly. Our sample had also reported that over half (65%) check their email daily, and nearly half (45%) reported that they do not like writing notes. Because our participants were accustomed to cell phones, they might perceive them as being more appropriate. Our participants also reported that they mainly used email for school or work, therefore they have a mindset that email is mainly used for professional purposes. Our sample may have been bias toward cell phone usage rather than email and note usage.

For future research, I would like for there to be a bigger participant pool, with about an even number of males and females. With an even number of males and females, we can conclude that there are no sex differences in emotion perception in CMC. I would also like to include a middle-aged group, of which they may be more accustomed to casual email and note use. An older age group who perceives email and notes for a more daily use might perceive more emotion in these mediums than the younger age groups.

Whatever the reasons may be as to why emotions are perceived differently in different mediums, many implications can still be drawn. One is that text messages may not always be the best mode of communication if trying to convey emotion. Another implication is that when giving negative news, an immediate format, or a phone conversation or face-to-face are the best way to deliver that news because of more emotional signals than in written communication. And

a final implication is that no matter what the message may be, text messages seem to be the best

way to go.

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Appendix

1. How do you feel, emotionally, about this message?
   A) Generally Positive
   B) Generally Neutral
   C) Generally Negative

2. On the scale below, rate the intensity of the emotion the message made you feel.

Little to None	Slight	Moderate	Strong
A	B	C	D

3.   On the scale below, how appropriate was it to receive this message in the form it was sent to you?

Not at all	Slightly	Moderately	Very
A	B	C	D
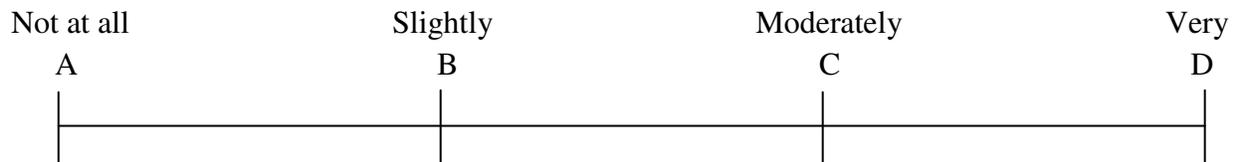
4.   Would you prefer to respond to this message in the same way it was sent to you?
   A) Yes
   B) No

5.   If no, how would you prefer to respond?
   A) Hand-written note
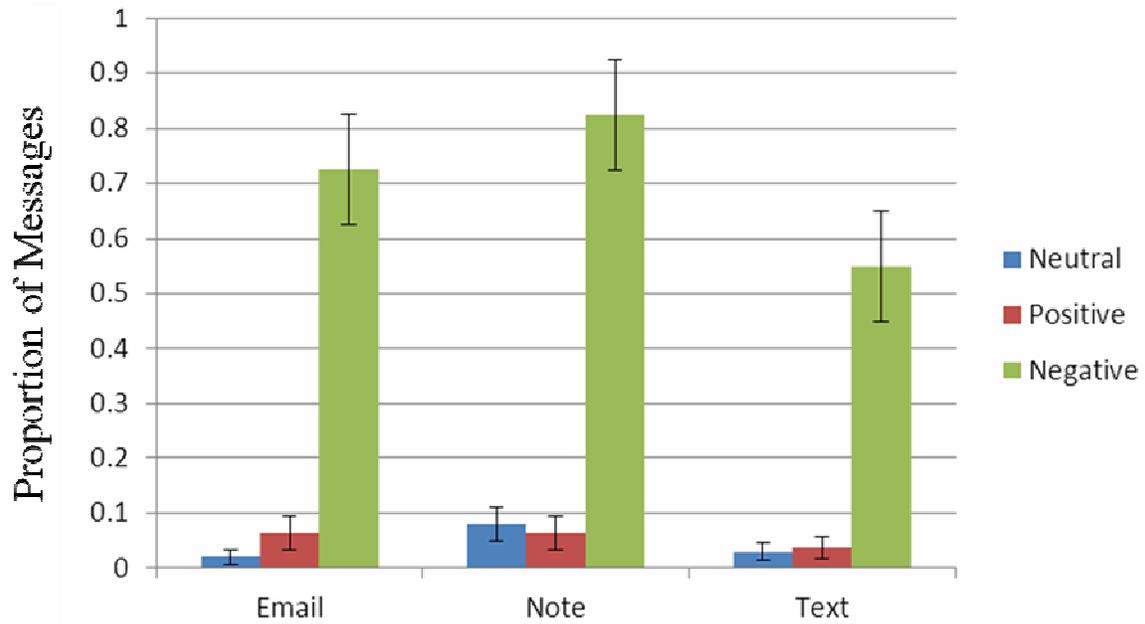   B) Text Message
   C) E-mail
   D) Does not apply

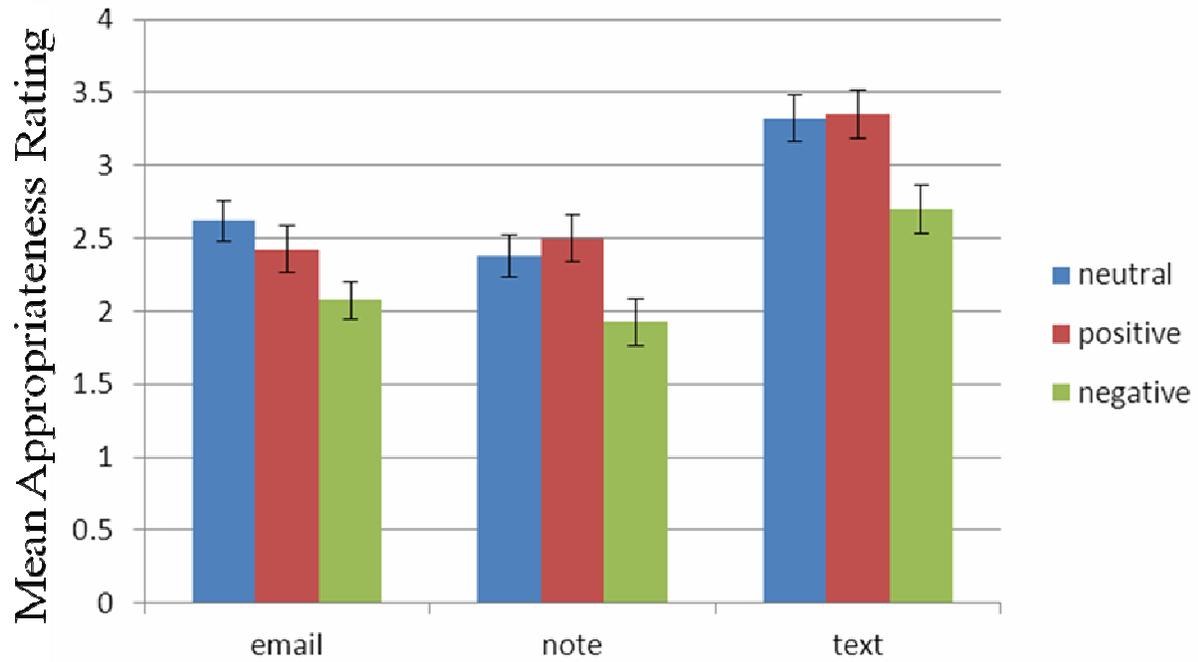Figure 1. Proportion of messages rated as being "Somewhat Negative"

Figure 2. Mean appropriateness ratings of emails, notes, and text messages.