

The Capacity to Delineate and Interpret Emotion in Text Messages

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### Abstract

Research indicates that emotion is not easily expressed or interpreted between senders and receivers who communicate through computer mediated communication methods such as text messaging. This fast paced, inexpensive and technologically advanced communication tool of text messaging has become a socially acceptable and valid form of communication in the twenty first century in many populations, cultures, and regions. Twenty pairs of female friends' abilities to delineate and interpret accurately the four emotions of: joy, anger, sadness, and guilt in eight different text message scenarios were investigated. The results determined that although the accuracy rate of the sender expressing an emotion and the receiver correctly interpreting the emotion was greater than chance, the accuracy rate was also below one hundred percent. Furthermore, a positive relationship was revealed between the sender's confidence and the receiver's accuracy rate of interpreting angry text messages.

### The Capacity to Delineate and Interpret Emotion in Text Messages

As the twenty-first century is well under way, it is not uncommon to see friends, family members and co-workers sitting together in silence, their eyes are often intensely immersed onto the screen of their cell phones responding to and reading text messages. This fast paced, inexpensive, and automatic approach to maintain friendships, receive information and quickly converse with one another has impacted and consumed not only the United States, but the world.

Although many perceive text messaging as convenient and affective method of communication, it may have some overlooked drawbacks and limitations. Because text messaging does not contain nonverbal cues that are often essential in interpreting emotion, many text message users may fail to completely communicate their intended feelings and emotion causing miscommunication between sender and receiver. Often, some text message users may have difficulty translating their emotions into text. Thus, if some users claim that they have trouble expressing their emotion through text format, why do they continue to use that form of communication to express emotion? Ultimately, as the difficulty to interpret peoples' intended emotion or expression rises through the use of text messaging, miscommunication seems likely.

### **Portability and Convenience of Text Messaging**

One of the greatest features of the mobile or cellular device is the portability of communication. One does not need to be limited to their home, phone booth, or landline to communicate to friends, family, co-workers or loved ones. Mobility, according to Ishii (2006) has a complex meaning apart from the definition of purely travel. Mobility

includes three interrelated dimensions: spatial, temporal, and contextual aspects of human behavior. “Contextual mobility is the key to understanding the social consequences of the introduction of mobile phones into society. Context is an important factor influencing interpersonal behavior” (Ishii, 2006, p. 347). Leung and Wei (2000) said in similar fashion, “it [cellular phone communication] overcomes mobility barriers of the conventional land-based phone” and it is an “interactive person-to-person communication tool that transcends the limitations of time and space” (p. 308).

It is known that the entrance of text messaging into the daily lives of people around the world has created a worldwide phenomenon. The Cellular Telecommunication and Internet Association, CTIA, has released information regarding the explosion of text message use. In June of 2008, seventy five billion text messages were sent in the United States; this is averaging about 2.5 billion text messages per day. Furthermore, in June of 2007, 28.8 billion text messages were sent in the United States. This represents a 160% increase of sent text messages between June of 2007 and June of 2008 (Reardon, 2008). This text message phenomenon is “particularly interesting because it represents a merging of written and oral communication modes...it is essentially a written form of communication that takes place interactively in real time” (Holtgraves, 2011, p. 92).

The age in which it is appropriate to own a cell phone is evolving as well. In 2000, 25% of teenagers age 13-24 owned a cell phone, in 2004, 38 percent of teenagers owned a cell phone. In 2004, the average of age of children owning a cell phone was 13 or 14 years of age, compared to 16 years of age in 2000 (Selian, 2004). In 2010, 75% of 12-17 years olds owned a cell phone and fifty eight percent of these children were twelve years old (Olson, 2010). Now, approximately 85% of children own a cell phone, and

thirty five percent of children at the age of eight receive their first cell phone (Adams, 2009).

### **Computer-Mediated Communication**

Although the phenomenon and popularity of text messaging has steadily increased over the past few decades, limited research on the topic of miscommunication is present. (Holtgraves, 2011). Research is slowly emerging on the topic; however, an abundance of research is present with regard to emotion, miscommunication, and the interpretation of computer mediated communication (CMC). Simpson (2002) defined computer mediated communication as “an umbrella term which refers to human communication via computers” (p. 14). Such examples of computer mediated communication include email, text messaging, and video conferencing. Furthermore, CMC can be differentiated into asynchronous and synchronous forms of communication. Asynchronous CMC is communication in which people are not communicating simultaneously. This form of communication includes email and discussion forums. Synchronous CMC is a medium in which communication happens in real time, such as, text-based online chat, computer conferencing, audio conferencing, and video conferencing (Simpson, 2002).

Although communicating via computer mediated communication is not the same as communicating via text messaging, the two forms of communication are similar in their text and lack of nonverbal cues. For the purposes of this current study and because text messaging can be argued as a subset of computer mediated communication research, expressing and interpreting emotion in computer mediated communication will be generalized to the effects of text message use by college aged students.

**What is Emotion?**

Thagard (2010) affirmed that two theoretical frameworks encapsulate the definition of an emotion. The cognitive appraisal theory states that emotions are, “judgments about the extent that the current situation meets your goals” (para.3). James and others believed that emotions “are perceptions of changes in your body such as heart rate, breathing rate, perspiration, and hormone levels” (Thagard, 2010, para. 4). Furthermore, Ekman (1992) established that universal emotions do indeed exist. After thirty years of researching Western cultures, all investigators found that six emotions clearly exist. These emotions include: happiness, surprise, fear, sadness, anger, and disgust combined with contempt. Fifteen years later after examining subsequent research, the researchers found that these six emotions are universal

**Emotion and Text Messaging**

Based upon the above operational definitions of emotions, it seems as if it may be difficult to express emotion solely based on textual data. This suggests that people who communicate through text message daily may encounter the risks of miscommunicating their intended purpose or emotion. Riordan and Kreuz (2010) conducted research concerning the reasons for use of computer mediated communication and, more specifically, their ability to emotionally encode and interpret such text. They found that, “across emotion types...participants reasoned that FTF [face-to- face interaction] allows more cues and is more effective than email at conveying emotion” (p. 1672). Moreover, they found that nonverbal cues such as gesture and eye contact convey emotion in a more effective matter. Participants in their study found it difficult to translate their emotions into text.

Text messaging is evolving into a social norm through which to communicate (Shuter & Chattopadhyay, 2010) As a result, research shows, changes are necessary in order to increase interpretation and delineation skills among text message users. Questionnaires sent to sixty-six potential users of the eMoto design, an interface on a mobile phone that produces affective gestures to the receiver of the text message, indicated that, “[users] showed a need for richer emotional expressiveness in text messaging in mobile phones than what is available today. Emotions are expressed not only through what is said, but also through body gestures and tone of voice-mediums not available in this context” (Fagerberg, Stahl, & Hook, 2004, p. 377).

As the difficulty to interpret peoples’ intended emotion or expression rises through the use of text messaging, miscommunication seems likely. According to Kato and Akahori (2005), the amount of emotion intended for a text message can create complications as the receiver decodes the text message sent to them. They found that the smaller the amount of emotion transmitted through the text message, the increased amount of anxiety, frustration, and anger to present itself in the receivers’ reaction. Thus, a likely explanation for the difficulty of expressing emotion via text messaging may be attributed to the importance, yet lack of nonverbal cues.

### **Nonverbal Communication**

The online *Collins English Dictionary* (2010) defined nonverbal communication as, “those aspects of communication, such as gestures and facial expressions, that do not involve verbal communication but which may include nonverbal aspects of speech itself (accent, tone of voice, speed of speaking, etc)” (2010). Bavelas and Chovil (2006)

defined facial expressions as the “visible acts of meaning [that] are part of the integrated message with words (p. 166)

Furthermore, Knapp and Hall (1997) observed that facial expressions show one’s emotional state, such as joy, anger, sadness and guilt. However, Eckman (1992) believed that facial expressions and nonverbal communication reflect the present emotional and psychological states in a person. As mentioned earlier in this review, his research on universal emotions exemplified that people of various cultures and ethnicities will have similar facial expressions when experiencing joy, anger, or sadness.

It is proposed by Mehrabian that ninety-three percent of communication is expressed nonverbally through nonverbal visual cues. Thus, this research conducted at UCLA found that 7% of communication involves actual words. Furthermore, 55% of communication includes visual cues such as body language and eye contact. Finally the final 38% of communication is represented by vocal cues. Examples of the vocal cues include: pitch, speed, volume, and tone of voice (Gallo, 2007). Theobald et al. (2009) and found that these nonverbal visual cues supplement the meaning of spoken words. Furthermore, head movements, facial expressions and body gestures are all examples of nonverbal communication that can be considered a nonlinguistic form of communication.

In relation to text message communication, Riordan and Kreuz (2010) found that the most common reason for choosing face-to-face interaction over text message communication was the ability to use nonverbal cues. Research conducted by Thurlow and Brown (2003) found that two thirds of all text messages examined in the study were sent to create, develop, or maintain a relationship. Yet, face-to-face communication was

deemed, “more effective, more personal, more comfortable and less permanent than CMC channels” (Riordan & Kreuz, 2010, p. 1667).

### **Motives Behind Text Messaging**

Many people understand the effectiveness behind face to face communication; yet, text messaging remains an alluring and popular alternative. The questions remains: although most understand the importance of nonverbal communication and body language, why do people, more specifically, young adults choose to use text messaging communication when nonverbal cues are lacking and miscommunication and misinterpretation may occur?

Research conducted by Pierce (2009) found a positive relationship between social anxiety and talking to people online or via text messaging. According to the research, communication through text messaging allows socially anxious or shy adolescents to avoid unpleasant or uncomfortable face-to-face communication and social interactions. Further, a research team found that female adolescents experience a greater sense of social anxiety in face-to-face interaction than do men adolescence. A female’s greater importance and desire for interpersonal relationships may be a reason for the difference. Adolescent females in the study often commented that they are shy but are more open and less anxious when talking through commuter-mediated communication (Hamburger & Ben-Artzi, 2000).

Finally, Reid and Reid (2007) conducted research and found great evidence to link text messaging to increased social loneliness. Participants who preferred communicating through social mediated techniques such as text messaging seemed to be lonelier, exhibited social anxiety during face to face interactions and had a greater ability

to self-disclose while communicating through text messaging rather than face-to-face interaction.

### **Relationship Maintenance Through the Use of Text Messaging**

Although the use of text messaging is commonly used despite one's age, the adolescents' and young adults' use of text messaging and other computer mediated communication devices is the primary focus in this present research. Research has found that 94% of all college students own a cellular device (Jin & Pena, 2010). Moreover, researchers are interested in the correlations between the use of computer mediated communication such as text messaging and creating, maintaining, and bridging relationships between adolescent and young adult populations. (Bryant, Sanders-Jackson, & Smallwood, 2006).

A study conducted by Jin and Pena (2010) attempted to assess "whether mobile communication between romantic partners is associated, as is face-to-face communication, with their relational characteristics including relational uncertainty, love and commitment, and attachment styles" (p. 40). The researchers investigated whether the use of cellular devices affected the level of confidence, love and commitment one has in the relationship, as well as the attachment styles represented by the participants in the study. Although the findings revealed an association between the frequency of voice calls and a positive relationship, the participants who were in the longest relationship used text messaging less often as a form of communication.

Pettigrew's research (2009) regarding text messaging and interpersonal research focused on past studies revealing that people in relationships text one another. Research conducted by Thurlow (2003) found that only one third of all text messages sent by

undergraduate college students had functional or practical goals such as verification and appointment setting. The remaining two thirds of all text messages were sent primarily for relationship maintenance, friendship maintenance, social functioning, and romantic maintenance. Furthermore, according to such studies, sixty one percent of messages sent were relationally-oriented. Great Britain researchers, Faulkner and Culwin (2005), classified text messages into fifteen specific categories and discovered that 57% of these messages related to interpersonal maintenance.

### **Erroneous Statements and Miscommunication in Text Message Communication**

Research conducted by Bordia (2007) found that understanding a partner or situation is poorer in computer mediated communication versus face-to-face communication. Kisesler, Zubrow and Moses (1985) discovered evidence to conclude that computer mediated communication generated a state of deindividuation. This state of deindividuation, as defined by Singer, Brush, and Lublin in 1965 is a “subjective state in which people lose their self-consciousness” (p. 356). Furthermore, Kato, Kato, and Scott (2007) found differences between the sender’s perceived emotional state and the receiver’s judgment of the sender’s emotional state. In essence, this research is indicating a gap between the sender’s emotion and the receiver’s perception of that particular emotion. However, the question still remains: does the sender purposely send passive and deindividualized text messages or does he exhibit the inability to send text messages that correctly describe their current emotional state.

In computer mediated communication, partners who communicated through this medium found it frustrating to communicate positive affective information. The inability of the sender to communicate positively and affectively often caused frustration to the

receiver of the positive information. Furthermore, the receiver of the text message often became frustrated at the medium which the sender used to express the emotion. (Kiesler et al., 1985). Often, it is argued that the use of emoticons allow the receiver of the text message to understand the emotion and intended meaning of the message sent by the sender. However, one of the few text message studies in English conducted by Ling and Baron (2007) found that the almost none (.001%) of the participants of their study used emoticons in their text messages.

On the contrary, it is indicated that communicating negative messages via text messaging or computer mediated communication has a tendency for creating miscommunication between the sender and the receiver of the text message. Research indicated that there is some truth behind the statement. A study of email communication pairs offered a twist in regards to previous research. The research demonstrated that judgment of emotions in such communication lacks accuracy; furthermore, a tendency exists to misjudge the partner's negative emotions as hostile (Kato & Akahori, 2004). Thus, miscommunication has taken place.

A research study conducted by Kato, Kato, Scott and Sato (2010) intended to investigate the sender's method in which to send the specific text message. The purpose of their research was to determine the way in which a sender transmitted the emotion they were experiencing as they sent the text message. Furthermore, in regards to the above research, another consideration needs to be taken into account. The amount of expression in a text message that may ultimately end in miscommunication needs to be assessed as well. In alignment with previous research of deindividuation, passivity, and the loss of self-consciousness, research shows a possible connection between the lack of emotion and the

presence of miscommunication (Kato et al., 2007). Research suggests that “low emotional cue transmissions tend to cause some misunderstanding because such emotions are closely connected with interpersonal problems” (Kato et al., 2007, p. 1903) The research collectively indicates that one’s lack of emotion in an anxious or angry text message may cause the receiver of the text message to interpret incorrectly the intentional emotion of the sender.

The research thus far on emotion in text messaging is beginning to suggest a framework related to the cause and motivation behind miscommunication and misjudgment when sending and receiving text messages. It can be agreed that most people do not intend to express their emotion improperly; furthermore, people do not purposely wish to interpret the intended emotional incorrectly. However, based on many research findings, miscommunicating emotions in text messages often happens. Thus, when partners wish to convey unpleasant or negative emotions, they do so weakly. Additionally, the person receiving the text message has insufficient information to judge the emotions of the sender. This insufficient information can include the sender’s decision to be passive regarding their true emotion and the lack of nonverbal cues (Kato et al., 2010).

### **Rationale**

The belief that many people may have a difficulty in sending a text message that accurately acknowledges their true emotion is the rationale for the present study. Because nonverbal communication such as body language, tone, facial expressions, and eye contact are not used in text messaging, it seems as if miscommunication may likely occur between sender and receiver. The study intends to determine the sender’s ability to create

text messages that elicit emotions of joy, anger, sadness, and guilt. Also, it proposes to determine the receiver's ability of interpreting joyful, angry, sad, and guilty text messages.

Text message communication, because of the lack of cues, hampers communication efficiency and encourages anonymity and a lack of awareness of the social context (Bordia, 2007). Many college aged students truly believe that they have the capacity and the ability to accurately express their emotion via text message. However, this research hopes to determine if there is a basis to this claim. Thus, although past research points to a difficulty in portraying one's true emotion without the use of nonverbal cues, this study anticipates to quantify the link between one's confidence of expressing the emotion and one's accuracy of expressing the emotion.

The goal of the research is to uncover if students exhibit an inability to delineate and interpret text messages that they send as well as receive. The central research question is whether college aged students can accurately convey emotions of joy, sadness, anger, and guilt through the use of text messages. Furthermore, do the college aged students have confidence in their ability of sending such messages? Thus, the following hypotheses are proposed for the present study-

1. The receiver of the text message will be able understand the emotion the sender wished to portray.
  - a. The accuracy rate of the sender expressing an emotion and the receiver correctly interpreting the emotion will be greater than chance. The accuracy rate will be greater than 25%, which is the level of accuracy if

the receiver was merely guessing which of four emotions was being expressed in the text message.

- b. However, the accuracy rate of the sender expressing an emotion and the receiver correctly interpreting the emotion will be less than perfect. The accuracy rate will be less than 100%.
2. There will be a positive relationship between confidence of the sender and the accuracy of the receiver correctly interpreting the expressed emotion at a  $p < .05$  significance level.

## **Method**

### **Participants**

The study took place at a medium sized, private university in Southeast United States in its psychology department. Undergraduate female psychology students were invited to participate in the study; their payment for participating included psychology activity credit. In order to eliminate possible gender effects, the participants were only female friend pairs. The study of male-male dyads and male-female dyads could be studied at a later date. Thus, a convenience sample of forty Liberty University female students—or twenty pairs of students--enrolled in psychology courses participated in a study assessing the text message receiver's ability to decode the intended emotion of the sender.

### **Materials**

The design of the study was adapted from Kato, Kato, Scott and Sato's 2010 study. However, that study was conducted only in a survey format. The participants were asked to read a generic scenario that was supposed to elicit a particular emotion. Then,

the participant was asked to imagine that she received a text message based upon that scenario. A survey was presented to the participants that asked questions regarding the degree of emotion the participants experienced as they read the scenarios, the degree of emotion they wished to portray to the sender of the text message and finally, and the degree of emotion they believed that the sender of the text message would experience if the participant responded to the original text message

However, the present researcher believed that the Kato et al. (2010) study's method may not have adequately measured the participants' abilities to express and decode emotion via text messaging. Furthermore, in many cases, text messaging occurs between friends or acquaintances. Thus, a previous relationship and familiarity is present when text messages are sent. In the Kato et al. study, a text message was not sent or even created by a friend or acquaintance.

To correct this possible flaw, the present study measured the ability of the sender to create an emotionally charged text message for the receiver, who was a friend or acquaintance, to interpret. Furthermore, the researcher developed multiple scenarios that were meant to elicit the emotions of joy, anger, sadness and guilt. Specifically, two scenarios were used for each of the four emotions. The scenarios used in the study are located in the appendix.

Finally, a survey was created to determine the accuracy of the sender's and receiver's ability to express and interpret the appropriate emotion. A survey was created for the sender of the text message, and a separate survey was also created for the receiver of the text message. The survey created for the sender of the text message intended to determine if the sender expressed the correct emotion to the receiver of the text message.

Next, the survey determined the sender's confidence in correctly expressing the correct emotion. The receiver's version of the survey asked what emotion she believed the sender wished to express. Distinct from many previous studies, this study also had many naturalistic characteristics. The participants were encouraged to use their own phones, they had no limit to the number of characters permitted in one text message, they were encouraged to text as they would in a real setting, and the procedure required the participant to send her text messages to a friend.

### **Procedure**

Pairs of friends came into the psychology department to participate in the experiment at their appointed time. Next, the dyad was informed of their rights involving their participation in the experiment. After, one female was labeled *the sender* of the experiment. The second female was labeled *the receiver* of the text message. The sender had the opportunity to use her own cellular device for the experiment. However, if she chose not to, there was a phone available for her to use.

To avoid any opportunity for the dyad to share any nonverbal cues during the course of the experiment, the two individuals were placed in two separate parts of the psychology department. The sender was given a scenario to read. The sender was to imagine that she just experienced the situation involved in the scenario. The sender then sent a text message to the receiver responding to the scenario (the situation she was involved in), following the cues of the scenario. The sender was to accurately express the correct emotion and try to make the receiver understand her situation. The sender was not permitted to use any emoticons. Furthermore, prior to the beginning of the experiment, the researcher informed the participants that the sender was not permitted to abruptly

state the emotion she was experiencing through the use of the direct word or a synonymous word. For example, if the sender was experiencing the emotion of sadness, the text message cannot abruptly state, "I feel sad" or "I am heartbroken." Because the participants used their own phones, and the text messages were not archived, the researcher cannot be absolutely positive that this rule was kept at all times. It can just be assumed that the participants followed the rule.

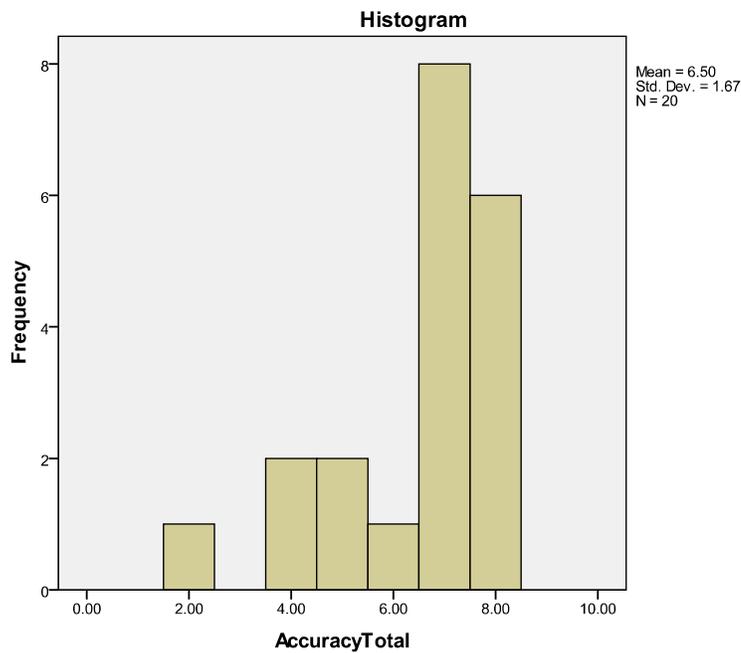
After the text message was sent, the sender answered a group of survey questions. Upon receiving the text message, the receiver read it, and answered a set of survey questions. The full experiment involves eight different scenarios. The sender and receiver repeated the process of creating and reading the text messages and completing the surveys until the completion of all eight scenarios. The eight scenarios included scenarios that emit joyful, sad, angry, and guilty emotions. However, the scenarios were not labeled to discriminate what emotion the sender should be experiencing when sending the text message. It was up to the sender of the text message to determine what emotion she experienced while sending the text message. Furthermore, the receiver of the text message did not see the scenarios. She only saw the text message sent to them.

### **Results**

The researcher sought to answer multiple questions regarding text message use and expressing the correct emotion using this type of communication. The first question determined the receiver's accuracy in determining the emotion the sender wished to express. The data collected was analyzed through SPSS.

First, the researcher analyzed in how many trials, out of eight trials, the receiver was able to determine and interpret the intended emotion communicated by the sender.

Each emotion (joy, anger, sadness and guilt) was represented by two separate scenarios, totaling eight scenarios. The data was coded to show emotion accuracy. If the emotion expressed by the sender was successfully interpreted by the receiver, the pair received one point. If the receiver did not select the correct emotion, the pair did not receive a point. Hence, each pair had the potential to receive eight points. The histogram of this data is shown in Figure 1. Further, Figure 2 shows the histograms representing how many trials, out of two trials, the sample correctly interpreted in each of the four emotions represented in the study.



*Figure 1.* Histogram displaying the accuracy of the receivers correctly interpreting emotion.

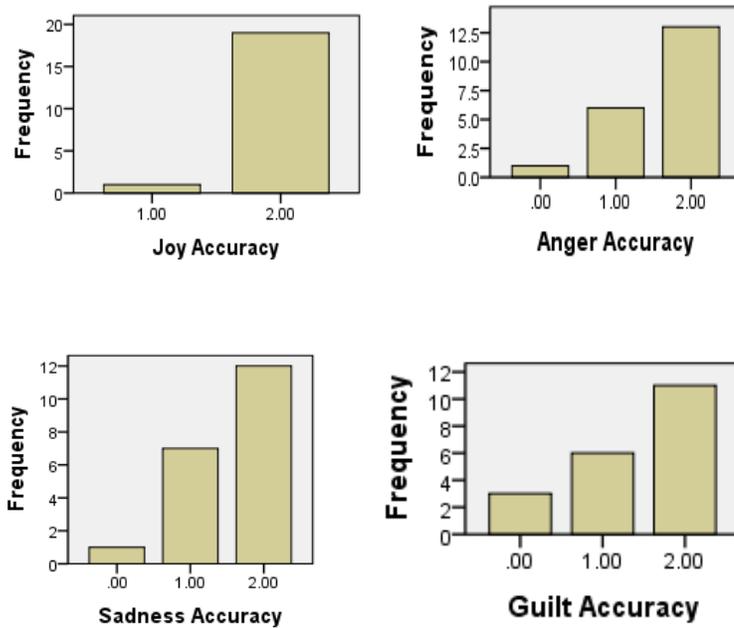


Figure 2. Accuracy rates of the subsets of emotions.

As shown, the histograms representing the accuracy rates of correctly expressing emotion and interpreting emotion are markedly skewed. This precluded using t-tests to test the first hypothesis. Instead, the accuracy hypothesis was evaluated using significance tests for proportions. The test was used to determine if the total accuracy rate was greater than chance but less than perfect. Since there were four emotions, a subject could have guessed the correct emotion 25% of the time by chance. In contrast, perfect accuracy would have been 100%. Hypothesis tests for proportions were used to compare for the total of all scenarios, and for each set of the individual emotions scenarios of joy, anger, sadness and guilt the accuracy rates to both chance (25%) and perfect (100%) accuracy.

Overall, the results displayed that the receiver of the text message could correctly interpret all emotion greater than chance. Thus, the accuracy rate was significantly above chance but below perfection. Furthermore, the receiver could not accurately interpret the

emotions of anger, sadness, and guilt perfectly. However, although 100% accuracy was not obtained, the accuracy rate was much greater than 25%--in fact, it was at least 70%. And for the emotion of joy accuracy was close to 100%. Nineteen out of the twenty pairs of subjects correctly expressed and interpreted the emotion of joy correctly.

Table 1: Accuracy rates and significance values

	Percentage of Accuracy	Significance Value at $H_0=.25$ (25% accuracy)	Significance Value at $H_0=1$ (100% accuracy)
Total	81.25%	$p<.001$	$p=.03$
Emotion of Joy	97.5%	$p<.001$	$p=.47$
Emotion of Anger	80%	$p<.001$	$p=.026$
Emotion of Sadness	77.5%	$p<.001$	$p=.017$
Emotion of Guilt	70%	$p<.001$	$p=.003$

The sender of the emotion was able to express her emotion and the receiver of the text message was able to interpret and distinguish the emotion. Further analysis was completed to see if, depending on the emotion and the accuracy of sending the correct emotion, the sender had a greater confidence that she expressed her emotion correctly. To test this hypothesis, a Spearman correlation was conducted to see if a relationship existed between the confidence level of the sender and the dyad's accuracy of expressing and interpreting the correct emotion. The results showed there was no significant relationship between overall confidence and accuracy when all eight scenarios were combined into a single analysis.

Each emotion was then individually analyzed with the sender's confidence in expressing the correct emotion. The joy, sadness and guilt correlations were not significant. However, there was a significant positive correlation between the senders'

confidence in sending an angry text message and the accuracy rate of the receiver correctly interpreting the emotion. The Spearman correlation was  $r_s(20) = .454, p=.0454$ .

## **Discussion**

### **Expressing and Interpreting Emotion via Text Messaging**

The literature on the topic of text message communication inferred that miscommunication can occur due to the lack of verbal cues in relationally based text messages. However, the results presented from the study differed from the inferences made by the researchers of similar studies. Approximately 30% of the sample had a 100% accuracy rate. Furthermore, 40% of the dyads had an 87.5% (7 out of 8 scenarios) accuracy rate. Surprisingly, the average accuracy rate in the study was 85%, which is much higher than the 25% that would have occurred if receivers were merely guessing which emotion the sender was attempting to communicate.

The implications of these results are significant and compelling for this body of research. Because previous research revealed that participants often had trouble expressing and interpreting emotion via computer mediated communication, this study investigated one's accuracy in interpreting the emotion of a text message. Much research reported in this paper was two to five years old. College students also participated in those studies.

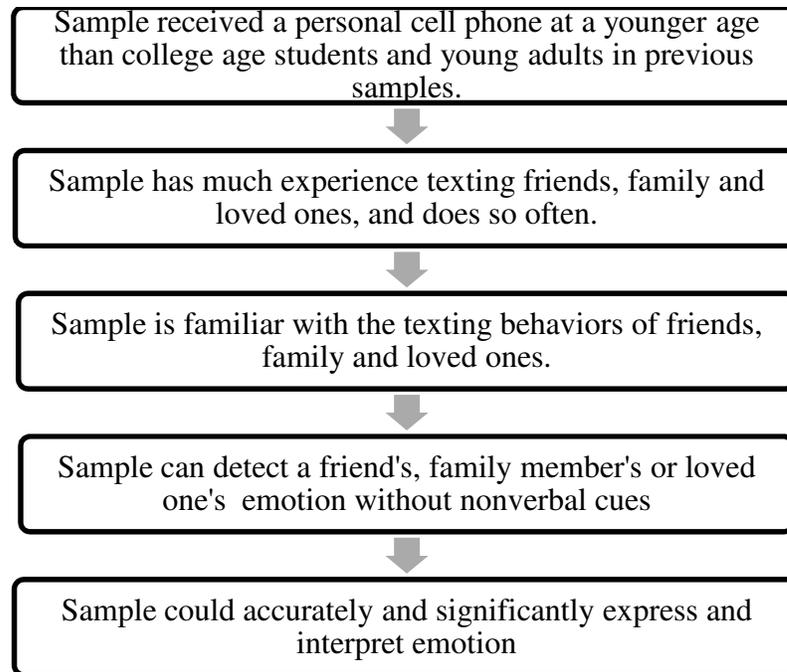
The dynamics, popularity and acceptability of using cell phones are evolving as evidenced by past literature. The sample used in the present study may be more experienced, may more heavily rely on text message use, and may send and receive more text messages daily than the samples used a few years ago. If these implications are accurate, the difference in findings may possibly be attributed to the present sample's

greater ability to express and interpret emotion in text messaging due to their greater use of and reliance on text messaging than their counterparts in earlier studies. Future research could be conducted to determine if adolescence and young adults, through the years, are getting better and more accurate in expressing and interpreting emotion via text messages. It may be possible that the problem of miscommunication is becoming a problem of the past, rather than a present dilemma. To test this hypothesis, future research could compare samples who text frequently to samples who text as a means of communication less frequently. The sample who texts regularly as a form of relational communication should have higher accuracy rates of correctly interpreting emotion via text message communication than the sample who texts infrequently. Another possible explanation is that college students are developing better techniques for communicating emotion via text messaging. A content analysis of the text messages sent could help determine if college aged students who text frequently use a special set of methods or strategies for expressing their emotion in these messages.

Furthermore, the present study had many different qualities and characteristics than past studies on expressing emotion in computer mediated communication or text messaging.. Past studies had participants take surveys about text message use, paired the sample with random participants to study the samples' text message behavior, and many studies had participants respond and predict the emotion in pseudo-text messages. However, distinct from the other studies, the present study asked friends to come and participate in the study together. Though the study was controlled for many variables and took place in a lab, the present study gave the participants many freedoms while participating. The participant was allowed to use their own phone, which created a sense

of comfort. Also, they were not given a maximum character count. The researcher encouraged the participants to text as they would on a regular basis, minus the use of emoticons. The researcher wished to get a clear and accurate glimpse of true text message behavior between friends.

The already established relationship between the participants may also have contributed to the high accuracy rate in interpreting the correct emotion in text messages. Because most people only send text messages to friends, family, loved ones, and sometimes acquaintances, the communication techniques used in texting may be commonly known by each other. This could be a factor or determinant in understanding others' text messages when there is a lack of nonverbal communication cues. Subsequent research comparing the accuracy of interpreting emotion between friends and random pairs could offer greater insight and a possible framework to determine if and why miscommunication is less likely now than before in text messages. This insight may be the key to understanding the high accuracy rate of correctly interpreting the emotion of the text message. The graphic below summarizes implications of this result.



*Figure 3.* Flowchart of results.

### **Accuracy Rate and Confidence**

According to the data, there was no significant correlation between the overall accuracy rate of correctly interpreting the sender's emotion and the sender's confidence that she expressed her emotion correctly. Thus, although the receiver could, in most cases, adequately define the emotion of the sender, a clear relationship between accuracy of the sender and confidence did not appear. Furthermore, detailed analysis of the joy, sadness, and guilt emotions exhibited the same lack of insignificant relationships.

These insignificant correlations may have been the result of a truncated range in the accuracy measure. Because most dyads interpreted seven or eight of the scenarios correctly, there was a very narrow range of accuracy, with the result that there was a very small variance exhibited in the accuracy of expressing and interpreting the given emotion. It may not have been possible to detect any underlying relationship between the

receivers' actual accuracy and the senders' confidence level. Ultimately, the truncated range may have made it impossible for a correlation or relationship to appear.

### **Accuracy Rate and Confidence in Angry Text Messages**

Although no relationship was discovered between the sender's confidence in expressing her emotion correctly and the accuracy rate of the receiver correctly interpreting the correct emotion in the areas of joy, sadness, and guilt, a relationship did exist when the emotion of anger was being assessed. Thus, it is interesting to observe that the sender was more confident that she correctly expressed her anger when the receiver was able to understand her anger. Similarly, when the sender of the text message was not quite as confident in her success of expressing her angry emotion, the receiver was less likely to accurately interpret the sender's anger.

Although interpretations of this result can be further analyzed, future research is the only way to truly determine the explanation for this relationship. In future research, a content analysis can be conducted to determine any common themes, words or phrases in the angry text messages compared to any common themes, words or phrases in the other emotional text messages. Linguistic analysis could possibly explain the relationship between confidence and accuracy in angry text messages. It may be harder to express anger in words rather than expressing joy, sadness and guilt in such a manner. Further, in a future study, different scenarios would be used to determine if similar results would appear. It could be argued, that the two scenarios used in the present study elicited greater anger in the sender than other scenarios would. Another idea for future research would include both a friend and a stranger be the correspondents of the text message. Thus, if the implications were correct, then the accuracy rate should be much lower in the

stranger's interpretation of the intended emotion than the friend's interpretation of the sender's emotion. Comparing the accuracy of friends to non-friends may determine if a prior friendship raises one's ability in expressing emotion via text message communication.

### **Limitations of the Study & Future Research**

With every research study, limitations occur that compromise the generalizations that can be made by the results. First, a random sample of the United States college-aged population was not assessed. This research only assessed one group of students at one university which may make implications from the data difficult for other populations. Surveying of only females is also a limitation. This study can only be generalized to the college female population. Further research would be required to determine if similar findings could be obtained with male students.

Other limitations occurred as well. First, the text messages were not saved by the researchers to determine if the sender followed the guidelines in sending the text message (no emoticons and not abruptly expressing the emotion). Further, the researcher did not analyze the content of the text messages sent. Later research could be conducted in a location in which a large male and female sample could be assessed to determine a male to male dyad, a male to female dyad, and a female to male dyad's ability to express and decode emotion via text message communication.

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Appendix

Table 2. Scenarios used in the study

Scenarios
Emotion of Joy Scenarios:
1. You stayed up all night studying for the final of your hardest class of the semester. You did so well on the final that it raised you failing grade to a passing grade.
3. You have been struggling financially. You just found out that you received a flexible job that pays very well. You wish to share the news with the receiver of the text message.
Emotion of Sadness Scenarios
1. The sender of the text message has been planning and looking forward to going out of town with the receiver of the text message for quite some time. However, a large group assignment is due the following Monday. The other group members have been procrastinating and the work is not complete. The group members are only free to meet over the weekend. The sender of the text message has to communicate with the receiver that he/she is no longer able to go out of town because of the group project.
2. You have been dating your significant other for an extended amount of time. Because you know your significant other is going in an opposite direction as you, you realize you are not suited to marry him. Against your desire, you are planning to break up with the significant other. You wish to share the news with the receiver of the text message.
Emotion of Anger Scenarios
1. You just drove around campus for an extended amount of time attempting to find a parking spot. The end result was a parking spot in the pit, and you arrived late to class and missed the quiz
2. You stayed up late preparing for your 7:40 class the following morning. Upon arriving to class, a memo is taped to the door of the classroom stating that the class has been cancelled. You realize there is not enough time to go back to your dorm and take a nap
Emotion of Guilt Scenarios
1. You have overcommitted your Saturday afternoon. You promised to help tutor the receiver of the text message in a class she was performing poorly in, but you just got invited to go out of town. You have decided to do the latter and you are texting the receiver to let her know that she has to back out of the tutoring commitments.
2. You borrowed the receiver's textbook right before the final examination. However, you accidentally left it in the library and nobody has turned it in. You have to inform the receiver that you lost the book.