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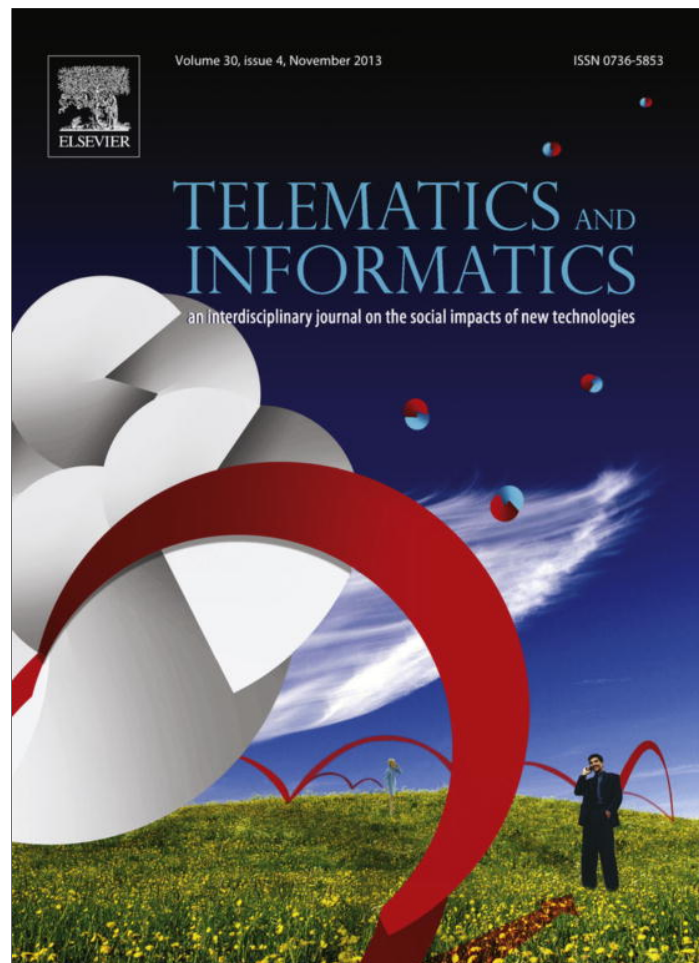


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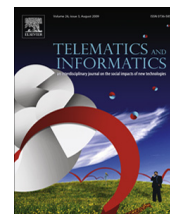
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Texting versus talking: An exploration in telecommunication language

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ABSTRACT

Prior research on text messaging has focused on its elliptical nature (e.g., acronyms, etc.). In contrast, the purpose of this research was to conduct an investigation of the type of words that tend to occur in text messages. Participants ($N = 224$) retrieved their most recent text messages which were then analyzed with the Linguistic Inquiry and Word Count (LIWC) program (Pennebaker et al., 2007a,b) and compared with parallel analyses of randomly selected telephone conversations ($N = 214$). The results indicated numerous linguistic differences between text messages and telephone conversations. The former were linguistically simpler, more personal and more affective than the latter. Overall, the results further our understanding of the linguistic dimensions of this relatively new form of communication.

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1. Introduction

Text messaging (texting for short) has become a ubiquitous means of electronic communication. According to a large scale survey conducted in the United States by the Pew Research Center' Internet and American Life Project, 75% of 12–17-year-olds own cell phones, 72% of all adolescents (88% of cell phone users) use text messaging regularly, and 54% contact friends daily via text messaging (Lenhart et al., 2010). Moreover, texting is a form of electronic communication with important implications for our understanding of communication processes. Despite the ubiquity and importance of texting, there have been relatively few empirical studies of this phenomenon, nor have there been any systematic comparisons of texting with other means of verbal communication. We first provide a brief review of prior research on text messaging followed by a description of the issues investigated in this research.

Text messaging is similar to email and instant messaging in that it represents a merging of written and oral communication modes. However, the highly interactive nature of texting sets it apart from those modes; it is essentially a written form of communication that takes place interactively in real-time. Moreover, cell phone users (unlike computer users) tend to carry their devices with them at all times thereby allowing them to text anytime, anywhere. In a focus group study, Horstmanshof and Power (2005) uncovered two general themes regarding texting. One theme was an unspoken rule about the immediacy of response needed to stay connected to the individual. A second theme was pressure to stay "in the loop" by carrying their devices at all times. A survey conducted by Reid and Reid (2007) demonstrated a similar tendency for those who reported preferring texting to talking; that is, they tended to form close-knit "text circles" staying in perpetual contact with their group of friends (see also Lenhart et al., 2010).

In terms of the language used when texting, one of the most notable and obvious features is its elliptical nature, that is, the frequent use of abbreviations, acronyms, emoticons, misspellings, and omission of vowels, subject pronouns, and punctuation (Crystal, 2008; Hard af Segerstad, 2005). Thurlow and Brown (2003) conducted a texting study in Great Britain in which participants were asked to produce messages from their phones. Messages in this study averaged 65 characters

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and 14 words (although variability was quite large). Abbreviations accounted for 18.75% of message content. However, a large majority of these users (82%) reported that they use abbreviations when they text. In a more recent texting study, Ling and Baron (2007) reported even briefer messages (averaging 7.7 words and 35 characters per message) and relatively infrequent use of emoticons (.001%) and acronyms (.005%).

Thurlow and Brown (2003) developed a preliminary coding scheme as a means of describing the content of text messages. They made an important distinction between informational and relational messages, the former referring to messages designed to provide information (e.g., directions) and the latter designed to create, develop, or maintain a relationship. They found a clear preponderance (approximately 2/3) of messages in the latter category. However, the relational aspects of texting can sometimes have an informational component. For example, Gritner and Eldridge (2003) found that navigating a future social event by means of updating information between users is a popular use for text messages. Text messaging serves as a social catalyst that fills in the time between initial plans and the execution of a social event; the text message acts as an RSVP to confirm whether an event is to take place or not.

Some researchers have examined personality and gender differences in texting. McKenna et al. (2002) found that those with high levels of social anxiety and shyness felt more comfortable connecting with others through computer mediated communication. Perhaps the anticipation of rejection that is associated with social anxiety is easier to deal with from a distance. Socially anxious mobile phone users appear to be relatively predisposed to take advantage of the social affordances of texting (Reid and Reid, 2010). More recent research has demonstrated that the language used to text reflects the texter's personality in much the same way that other forms of language use reflect one's personality (Holtgraves, 2011). In this study, for example, extraversion was related to the use of more personal pronouns ($r = .14$), especially first person singular pronouns ($r = .19$), and negatively related to the use of impersonal pronouns ($r = -.18$). Neuroticism was positively correlated with negative emotion words ($r = .15$). Agreeableness was negatively correlated with swearing ($r = -.18$), and negative emotion words ($r = -.25$).

In terms of gender differences, Horstmanshof and Power (2005) found males to be more reluctant than females to follow the social "rules" of responding immediately to text messages from significant others. Some of the males in this study described carrying their devices as being on a social leash that confines them to the immediate response rule. In the large-scale study conducted by Ling et al. (2010), females were more likely to text than were males, and were more likely to use emoticons than were males, a finding also reported by Holtgraves (2011).

2. The present research

Prior research on texting has tended to focus on its elliptical nature (i.e., use of abbreviations, acronyms, etc.). In contrast, no one has yet undertaken systematic, empirical analyses of the lexical aspects of texting. To pursue this, we used the Linguistic Inquiry and Word Count program (LIWC; Pennebaker et al., 2007b) to generate category (e.g., verbs, personal pronouns, impersonal pronouns, etc.) counts for a set of text messages. This program counts the occurrences of words within its dictionary, as well as categories (e.g., verbs, emotion words, etc.) that constitute a subset of those words.

Currently, the LIWC program analyzes text documents for 70 categories and includes a base dictionary of almost 4500 words and word stems. The 70 categories fall into one of three groups: linguistic processes, psychological processes, and current concerns. The LIWC has been shown to have good internal consistency and temporal reliability (Pennebaker et al., 2007a) and constitutes a valid method for measuring personal expression of emotion (Pennebaker and King, 1999; Mehl and Pennebaker, 2003; Mehl et al., 2001), personality traits such as the Big 5 (Pennebaker and King, 1999) and self-esteem (Bosson et al., 2000), as well as linguistic markers of age (Pennebaker and Stone, 2003), gender (Mehl and Pennebaker, 2003), and deception (Bond and Lee, 2005; Newman et al. (2003).

We complemented our linguistic description of text messages by comparing it with an analysis of telephone conversations. To do this, a corpus of publically available telephone conversations was analyzed simultaneously with the LIWC. A fundamental problem, of course, is that it is not possible to control for all possible differences between the text and telephone data sets (participant differences, topic differences, etc.). We assumed that if there were no significant differences in the current concern categories, then the two data sets were equivalent enough to allow for the examination of linguistic and psychological differences. Although these comparative analyses are largely exploratory, based on prior research (Reid and Reid, 2007; Thurlow and Brown, 2003) we did expect text messages to be more affective (contain a higher percentage of affective words) than telephone conversations, and for telephone conversations to be more complex (e.g., contain a higher percentage of function words) than text messages.

Finally, for each text sent, texting participants indicated where, when, and with whom they texted. We conducted exploratory analyses of these responses in order to provide an initial picture of this aspect of texting.

3. Method

3.1. Texting participants

Participants were 224 students (104 males; 120 females) enrolled in introductory psychology classes at Ball State University who participated for partial course credit. The age of the participants ranged between 18 and 41 ($M = 19.08$; $SD = 1.12$),

although almost all (96%) were between 18 and 21. The sample was primarily Caucasian (89%), but included African-American (5%), Hispanic (4%), and Asian (2%) participants as well.

3.2. Procedure

Participants signed up for an experiment titled Cell Phone Research and were asked to bring their cell phones with them when they attended an experimental session. Experimental sessions consisted of small groups of between 1 and 10 students. Participants were asked to use their cell phone and retrieve the last 20 text messages that they had sent. They were instructed to write down the exact content of each text message. In addition, for each message, participants indicated the time and date the message was sent, whether others were present when the message was sent, and their location when the message was sent (e.g., home/apt., in class, etc.). Participants also rated the extent to which they liked the recipient (1 = dislike strongly to 7 = like strongly), the extent to which they were close to the recipient (1 = extremely distant to 7 = extremely close), the recipient's gender, the recipient's relative age (1 = much younger than me to 5 = much older than me), the length of time the participant had known the recipient (1 = less than 24 h to 9 = all my life), and the nature of the relationship with the recipient (friend, family, spouse or boy/girlfriend, roommate, other)¹.

3.3. Telephone conversations

A sample of telephone conversations was randomly chosen from the American National Corpus (<http://www.american-nationalcorpus.org/OANC/index.html#>), an ongoing project that involves the development of a large corpus of American English (a corpus comparable to the British National Corpus). The open ANC web site contains 2307 telephone conversations with a total of 3,019,477 words taken from the Switchboard data set (Godfrey et al., 1992). Two hundred fourteen conversations were randomly selected from this set. The Switchboard corpus is a multi-speaker corpus of telephone speech with approximately 2500 conversations by 500 speakers from around the US. These conversations are transcribed by speaker turns and span 70 topics (e.g., camping, taxes, recycling, etc.).

3.4. Coding

The text messages and telephone conversations were analyzed with the LIWC program. The LIWC was originally developed as a means of efficiently examining the content of participants' emotional writing in order to identify features of their writing related to subsequent health (Pennebaker and Francis, 1996). The program consists of a dictionary of words (approximately 4500 in the current version) that tap a number of hierarchically-ordered dimensions. Samples of talk are analyzed on a word-by-word basis, each word being compared against the dictionary file. In the version used here (Pennebaker et al., 2007a,b) there are twenty-two standard linguistic categories (e.g., percentage of verbs, articles, etc.), thirty-two psychological construct categories (e.g., affect, cognition, etc.), seven personal concern categories (work, home, etc.), and several additional categories (e.g., punctuation, paralinguistic). The LIWC has been shown to have good internal consistency and temporal reliability (Pennebaker et al., 2007a,b).

The LIWC was not developed for use with text messages. Hence, (with the exception of emoticons in the 2001 version) it does not contain categories that capture the various linguistic alterations that can occur in text messages. Because of this, we expected the standard LIWC dictionaries to capture more of the items in telephone conversations than in text messages. A separate set of categories designed specifically for text messages (e.g., abbreviations, etc.) were developed (see Holtgraves, 2011) but not used in this study because these categories would not occur in telephone conversations.

4. Results

Participants provided between 1 and 20 messages ($M = 18$, $SD = 4$), and over 75% of participants provided the requested 20 text messages. Messages were short and frequent. The word count per message varied between 0 and 42 ($M = 8.11$, $SD = 6.684$), with 90% of the messages containing 17 words or less. This is very similar to the data reported by Ling and Barron (2007). Messages containing no words (only symbols or emoticons) occurred but were rare (.3%). Participants texted frequently with a mean time between texts of 5.29 min (median = 3.6 min.). The number of different people to whom participants sent texts varied between 1 and 20 with a mean of 4.3.

4.1. Texting behavior: where, when, and with whom

Text messages were sent more frequently when others were present (60%) than when the texter was alone (40%). Over half (53%) of the texts were generated at one's own home/apartment/dormroom. The next most common location was class (14.1%), followed by another person's home (5.3%), store or restaurant (3.1%), vehicle passenger (1.8%), work (1.2%), and

¹ Participants also completed measures of the five-factor model of personality (Goldberg, 1992), self-monitoring (Snyder, 1974) and aggression (Buss and Perry, 1992). The results of the personality differences are reported in Holtgraves (2011) and will not be presented here.

driving (1%). In terms of participants' relationship with message recipients, 54% of the messages were sent to recipients designated as friends, and 29% to a recipient designated as a significant other. The remainder of the messages were sent to family members (12%) and roommates (2.3%).

There was a fair amount of variability in terms of how long texters knew message recipients, although texting new acquaintances (i.e., known less than one month) was fairly infrequent (<5%). Texting people known for one's entire life (most likely family) was more common (>11%). Text recipients were most often similar in age to the texter (69%), and texting to someone younger (10.1%) and older (20.5%) occurred less frequently. Recipients were more likely to be female (54.6%) than male (45.3%). Males were more likely to text females rather than males (62.7% vs. 37.3%); females showed the reverse (but smaller) pattern and were more likely to text males (52.8%) than females (47.2%).

4.2. Texting vs. phone conversations

A data set was created consisting of the mean occurrence of each of 63 categories in the text messages and the telephone conversations. All LIWC (2007) categories were included in the analyses except for punctuation (not relevant for phone conversations) and all spoken categories (not relevant for text messages) with the exception of the assent category. For text messages, participant-level data was used such that the reported LIWC means represent each category across all of the text messages (usually 20) provided by a participant. As expected, the standard LIWC (2007) dictionary classified a higher percentage of the words in telephone conversations (92.17%) than in the text messages (82.63%). This difference is largely due to the texting categories (e.g., abbreviations) that occurred in text messages (11%) but not in telephone conversations (and hence were excluded from the analyses presented here).

Because of the large number of comparisons that were made, we report as significant only those differences for which $p < .001$. Also, when the homogeneity of variance assumption was violated (i.e., significantly different variances via Levene's test) adjusted t values are reported. All significant ($p < .001$) differences for the linguistic (Table 1) and psychological (Table 2) categories are presented, with the category means representing the percentage of words that were classified with that category. Note that in this way word count differences between modalities are controlled. In these tables, categories that occurred more frequently for texting than for phoning are presented first, followed by categories that occurred more frequently for telephoning than texting. Analyses of the current concerns categories yielded only one significant difference (the money category occurred more frequently in telephone conversations than in texts), suggesting that the examination of linguistic and psychological differences was justified.

4.3. Linguistic processes

Overall, telephone conversations contained more large words (six letters or larger) than text messages. However, there was much more variability in the texts than in the telephone conversations. The percentage of words in single text messages

Table 1
LIWC linguistic category means (percentages) for text messages and telephone conversations.

	Texting	Telephone	t
	Texting > Telephone variables		
<i>Category</i>			
1st Person singular	7.34	5.53	7.18
2nd Person	4.14	2.99	4.96
Future tense verbs	1.21	.80	4.25
Negate	2.79	2.09	4.02
Assent	8.85	3.34	9.45
Swear	.54	.02	7.97
<i>Telephone > Texting Variables</i>			
Six Letter Words	8.03	10.63	8.55
Function	45.79	61.76	23.64
Pronouns	17.78	20.41	6.43
1st Person plural	.56	1.29	8.73
3rd Person plural	.22	1.58	19.74
Impersonal Pronouns	4.87	8.13	15.60
Articles	2.15	5.58	27.02
Verbs	16.49	17.97	4.12
Past tense verbs	2.76	3.66	5.25
Auxiliary Verbs	10.11	11.15	3.94
Prepositions	7.19	10.18	13.05
Conjunctions	3.60	8.08	29.80
Quantifiers	1.18	2.85	18.80

Note: All reported t s and associated probabilities adjusted for unequal variances. All t s are significant at a minimum of $p < .001$.

Table 2

LWIC psychological processes category means (percentages) for text messages and telephone conversations.

	Texting	Telephone	<i>t</i>
	Texting > Telephone variables		
Category			
Affect	14.26	4.50	16.09
Positive emotion	12.06	3.95	13.92
Negative emotion	2.28	.84	9.82
Anger	.83	.25	6.62
Sad	.33	.12	5.07
Biological processes	2.38	.79	11.43
Body	.56	.18	6.49
Health	.56	.29	4.09
Sex	.87	.07	8.61
Perceptual Processes	2.07	1.51	4.31
Feel	.58	.31	4.24
<i>Telephone > Texting variables</i>			
Cognitive Mechanisms 11.43	11.43	19.67	23.35
Insight	1.43	3.40	14.96
Tentative	1.97	3.76	12.30
Certainty	.84	1.54	6.36
Inclusive	2.20	5.56	24.39
Exclusive	2.45	3.96	10.80
Family	.21	.40	3.94
Space	4.38	5.57	5.63

Note: All reported *ts* and associated probabilities adjusted for unequal variances. All *ts* are significant at a minimum of $p < .001$.

that were large words (six letters or larger) ranged between 0 and 100%; 58.4% of the messages did not contain any large words and 1.1% contained only large words. When participants were the unit of analysis, the percentage of large words varied between 0% and 20.9% (6.2–18.4% for telephone conversations).

There were significantly more function words in the telephone conversations than in the texts, including more articles (a, the), conjunctions (and, but), prepositions (to, with), and the overall pronoun category. There were differences between texts and phones, however, in terms of pronoun type. Specifically, texters used more 1st person singular (I, me) and 2nd person (you, your) pronouns than did those speaking on phones, with the latter using more 1st person plural (we, us) and 3rd person plural (they, their) pronouns, as well as more impersonal pronouns (it, those). There were more verbs in phone conversations, including more past tense and auxiliary verbs (am, will), than in text messages. However, text messages contained significantly more future tense verbs (will, gonna) than did telephone conversations. Texts also contained significantly more negations (no, never), assents (yes, OK) and swear words (damn, piss) than did telephone conversations.

4.4. Psychological processes

There were clear and distinct differences in the psychological processes in texts and telephone conversations. Simply put, texts were affective and biological and phone conversations were cognitive. There were far more affective words, both positive (love, nice) and negative (hurt, hate), in the texts than in the phone conversations. And there were more biological processes, including the categories of body (cheek, hands), health (flu, pill), and sex (horny, love), in texts than phone conversations. In contrast, cognitive processes, including the categories of certainty (always, never), insight (think, know), tentative (maybe, perhaps), inclusive (and, with), and exclusive (but, without), were far more frequent in phone conversations than in texts. There were also more perceptual processes, including the category feel, in texts than in phone conversations. The only social process for which there was a difference was the family category (daughter, husband) which was larger for phone conversations than texts.

5. Discussion and conclusions

Despite the ubiquity of texting, there have been relatively few empirical studies of the language of texting. Hence, there is a need for empirically-based descriptions of the content and structure of text messages, especially in terms of how texting differs from other forms of communication. The purpose of the present study was to undertake some initial analyses of the language of text messages, when, where and to they are sent, and how they compare with telephone conversations.

The results point to some very clear differences. Texting, relative to telephone speech, is personal, affective (rather than cognitive) and intimate. Texters reference themselves and their recipients only; pronouns are singular rather than plural (I and you rather than we and them). Affective words (both positive and negative), as well as swear words, occurred at a rate

that was approximately three times the rate that occurred in the telephone conversations. The texts in this sample were largely short, frequent bursts of affectively laden content. Hence, text messages appear to be more relational – a mechanism for maintaining social connections – than informational.

At the same time, text messages also appear to be used for planning purposes, and these messages may be both informational and relational. Although phone conversations contained more verbs overall, text messages contained a significantly higher percentage of future tense verbs, a difference suggesting that texting was used in the planning of future events (Gritner and Eldridge, 2003). Texts also contained a higher percentage of assents (yes) and negations (no), a feature that most likely also reflects this planning function.

In contrast to text messages, telephone conversations were more complex and cognitive (rather than affective). Linguistic complexity was indexed with higher rates of six-letter words, as well as more function words, impersonal pronouns, verbs, conjunctions, articles, and prepositions. In terms of psychological processes, there were a variety of markers of cognitive processes (cognitive mechanisms, insight, inclusive, exclusive). Cognitive complexity was indexed with higher rates of both certainty words and tentative words.

Text messages are short by nature, but the major findings in this study reveal differences that are not simply attributed to brevity. Consistent with other reports (Lenhart et al., 2010), participants in this study sent text messages quite frequently. And they did this anywhere. Although sent from anywhere, texts were sent almost exclusively to close friends and significant others and hence the recipients were roughly the same age as the sender. These short affective messages appear to be, in a sense, a means of social grooming, a way of maintaining an affective connection regardless of one's location. There is no doubt that cell phones have created a new means by which people are able to contact one another much more readily (Ling, 2008).

Despite the ubiquity of texting, there are no doubt individual differences in the preference for communication with this modality. For example Reid and Reid (2005; see also Rettie, 2007) described their sample as breaking down into talkers and talkers. The latter prefer talking on the phone but will also text frequently, using it as a complimentary communication channel. The former, in contrast, generally feel uncomfortable on the phone and use texting as their primary means of communication, taking advantage of the greater control over the timing of one's responses that texting affords. An interesting avenue for future research would be to examine whether these differences in the preference for texting are reflected in the language of one's texts.

One limitation of the present research is the possible differences between the texting and the telephone conversation participants; hence, the language differences we report should be viewed with some caution. However, several aspects of our data suggest that the major language differences we report are most likely a function of communication modality. First, differences between texts and phone conversations occurred not for the personal concern categories (with the exception of money) but rather for the linguistic and psychological categories. Given that there were no differences in personal concerns, but substantial linguistic and psychological processes differences, suggests to us that the differences between the two data sets (participant characteristics, topics, etc.) are not really driving the differences we see (otherwise we'd see them for personal concerns as well). In addition, the linguistic and psychological differences that we report are not small differences. They are large and substantial differences (see the *t* values in Tables 1 and 2) and unlikely to be a function of differences in terms of topic, participant characteristics, etc. The large differences we see linguistically and psychologically, in the context of no differences for personal concerns, suggest to us that it is the medium that is mostly responsible for the linguistic/psychological differences.

A related issue with this research concerns the potential non-representativeness of our texting participants. The texting participants were young college students in Indiana who probably differ in several ways from the larger population, a fact that must be kept in mind when attempting to make broad generalizations about texting behavior based on the present data. Still, it is students who have pushed texting in the US and elsewhere and so the behavior of our texting participants is probably fairly typical.

Overall, and despite these limitations, the present study presents clear evidence of linguistic and psychological differences between the language used in text messages and telephone conversations. Further research is required to examine possible demographic boundary conditions for these differences.

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