

Differences in the Linguistic Features of Text Messages send with an Alphanumeric Multi-Press Keypad Mobile Phone versus a Full Keypad Touchscreen Smartphone

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Abstract

Technology often mediates, and thus influences, patterns of human communication. Mobile phones have recently improved, most notably, full keypad touchscreen smartphones. Fifty university students send text messages with a traditional multi-press alphanumeric keypad mobile phone and a full keypad touchscreen smartphone. Compared to messages sent via multi-press mobile phones, smartphone messages were longer, contained fewer number/letter homophones (e.g., cu rather than see you) and contained more punctuation and fewer misspelled words. Nonetheless, regardless of type of phone used, text messages evidenced use of the language form known as digitalk or textese, suggesting that keypad limitations cannot entirely explain the unique patterns of written communication associated with mobile phones.

Keywords: Mobile phone; cell phone; smartphone; text message; multi-press; touchscreen

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Text messaging, or texting, is the act of typing and sending a written message from one mobile phone to another. Globally, there were 7.8 trillion text messages sent in 2011 (Portio Research, 2012). It is forecasted that text messaging traffic will continue to increase reaching 9.4 trillion messages by 2016 (Informa Telecoms and Media, 2012). American adolescent text messaging rates are reported at an average of 4,050 texts per month and young adults, age 18-24, average 1,630 texts per month (Nielsen, 2009). In popular media, adolescents in the United Kingdom are referred to as *text maniacs* (Waugh, 2012). Pervasive, intense and prolonged use of mobile phones to send text messages is transforming patterns of human communication (Wei, Wang, & Klausner, 2012).

At the beginning of the current century, mobile phone technology was restricted to the alphanumeric keypad where one button was pressed up to four times to select a specific character, for example, the number seven key was pressed four times to input the letter s (Taylor & Vincent, 2005). More recently, “the advent of new multimedia smartphones, touchscreens, and full keypads has facilitated the process by which texting has become a commonplace occurrence for the youth of today” (Skierkowski & Wood, 2012, p. 744). In 2010, 43% of American youth reported that text messaging was the primary reason for owning a mobile phone and, in particular, that a device with a full keypad, as in smartphones, facilitated text messaging (Nielsen, 2011). In fact, the original alphanumeric mobile phones took almost seven years to approximate 50% popular use while smartphones have taken only four years to reach the same level of market penetration (Technology Review, 2012). In 2012, Singapore, China and Thailand all reported smartphone ownership in excess of 50% of the adult population (Mastercard Worldwide, 2012). On the eve of Apple’s unveiling of the iPhone 5, 66% of Americans aged 18-29 years reported owning a smartphone (Rainie, 2012). In general, mobile phone technology has dramatically increased opportunities for human communication (Johnson, 2012) and, specifically, full keypad touchscreen smartphone technology may further enhance human capacity to communicate. However, as with all communication tools, the nature and form of communication is affected (Olson, 2005).

Mobile Phones and Text-Based Communication

“The use of text messaging by adolescents is a widely accepted phenomenon that has grown rapidly in the last few years in response to the advent of new and more affordable mobile phone technologies” (Skierkowski & Wood, 2012, p. 744). The practice of text messaging has birthed a language form with its own vocabulary referred to as *textese* (Drouin, 2011) including unique “grammatical, lexical, stylistic and visual features” (Taylor, 2009, p. 33). Such linguistic features include “abbreviations, acronyms, emoticons, misspellings, omission of vowels, subject pronouns and punctuation” (Ling & Baron, 2007, p. 292). Since creative use of text-based communication first emerged in forms of computer-mediated communication (e.g., instant messages), the term *digitalk* is also commonly used to refer to the playful manner in which text messages attempt to capture “voice of the speaker” (Turner, 2010, p. 43). However, linguists postulate that interaction between the mobile phone device and the mobile phone user creates unique and specific patterns of text-based communication (Thurlow & Poff, 2011). Kemp and

Bushnell (2011) attributed many of the linguistic features of text messages “to texters’ desire to overcome the confines of the alphanumeric mobile phone keypad” (p. 19).

When texting, adolescents and young adults demonstrating considerable creativity in maximizing meaning while minimizing effort (Watt, 2010). Several studies (Kemp & Bushnell, 2011; Plester, Wood & Joshi, 2009; Powell & Dixon, 2011) have concluded that textese reflects linguistic originality and playfulness where users access existing phonological knowledge to produce textisms that are variants on Standard English forms. Thurlow and Poff (2011) claimed that “the language of text messaging is constantly changing” (p. 13). Therefore, the linguistic features and “glossaries of textisms should be seen as descriptive and possibly idiosyncratic rather than prescriptive and general” (Kemp, 2010, p. 66). The lack of a standard collection of text message conventions and specific textisms suggest that, according to Coe and Oakhill (2011) “variations evolve and disappear so quickly” (p. 12).

Turner (2010) identified distinct features in text messages including unconventional capitalisation, unconventional end-of-sentence punctuation, lengthening words with additional consonants or vowels, unconventional use of ellipses, omitted apostrophes, phonetic spelling, abbreviations and formation of new compound words. Baron and Ling (2011) reported that traditional punctuation had been “repurposed” (p. 61) to suit the needs of the text message creator and recipient, for instance, ellipses and smileys in place of periods. This aligns with Watt’s (2010) contention that existing language and literacy skills are being adapted (p. 143) as users craft text messages. Varnhagen et al. (2010) created a taxonomy of new language forms identified in instant messages and described these variations as “a natural experiment in the development of written communication” (p. 731).

Taylor and Vincent (2005) queried the effect of the predictive text function, built into the text messaging application, where the user presses a sequence of single keys and the mobile phone uses a dictionary to predict the intended word. Supporting the notion of textese as an enduring language form, Kemp and Bushnell (2011) reported similar occurrences of testisms in messages sent with and without the predictive text function activated. While De Jonge and Kemp (2012) hypothesised that predictive text would “greatly reduce or even eliminate” (p. 62) the use of textisms, half their sample of high school and university students used textisms in sending text messages (13-16% of total words per message) regardless of activation of the predictive text function. However, Drouin and Driver (2012) found that use of the predictive text application moderated text message errors of capitalisation and punctuation due to the autocorrect feature. Thus, as the technology improves, the quality of text messages, according to the conventions of standard written English, improves in some, but not all, cases.

Although text messaging is a relatively recent phenomenon, a considerable volume of research has described the patterns of written communication associated with mobile phones. The impact of increasingly popular full keypad touchscreen smartphones on text messages features requires investigation. The aim of the current investigation was to determine the effect of mobile phone input method on the linguistic features of text messages. Specifically, does mobile phone input device (i.e., alphanumeric multi-press versus full keypad touchscreen) have an effect on the linguistic features of text messages including message length, occurrences of specific textisms and variation in patterns of punctuation and capitalization?

Research Methods

Because young adults are associated with emerging technologies and changing patterns of communication (Skierkowski & Wood, 2012; Wei et al., 2012), research participants were recruited from a student study area at a comprehensive university. Individuals in the study area who did not appear to be engaged in learning activities (e.g. on Facebook, browsing the internet or talking to others in the study area) were queried as to their willingness to participate in a study on text messaging. University students who agreed to participate were invited to complete research tasks at their convenience. Approximately 90% of students opted to participate immediately, while approximately 10% delayed participation to a later time. Research participant recruitment stopped when a sample of 50 university students had completed required research tasks; the data provided by 50 university students allowed for statistical comparison of the linguistic features of text messages sent with an alphanumeric multi-press keypad mobile phone and a full keypad touchscreen smartphone.

Research participants: Fifty university students.

The mean age of the 50 research participants was 21.3 years (SD 4.34) with the oldest participant reportedly 41 years of age and the youngest participant reportedly 17 years of age. Seventy percent of participants were female and 30% were male. Participating university students were enrolled in 17 different courses of study. Forty-four percent of research participants reported enrolment in Bachelor of Education programs, 32% reported enrolment in a Bachelor of Arts program and 20% reported enrolment in Engineering, Science, Commerce, Pharmacy or Psychology programs of study. The final 4% (i.e., two participants) reported enrolment in English language studies in order to gain entrance into further university study. Students reported an average of 1.9 completed years of university study (SD 1.40). Thirty-nine participants (78%) indicated English as their first language while eleven participants (22%) reported speaking a first language other than English.

Data collection: Student text messages across distinct devices.

In an office located adjacent to the study area, each university student was individually advised of their rights as research participants. Next, students received instructions regarding required research tasks and, finally, students sent two text messages, one with an alphanumeric multi-press keypad mobile phone and another with a full keypad touchscreen smartphone. Similar to procedures used in previous studies (Coe & Oakhill, 2011; Plester et al., 2009), students send text messages in response to scenarios. Since two text messages were sent with two distinct devices, two scenarios were required, as follows:

1. It's a Friday afternoon and you text a friend, inviting them to meet you and some other friends that night. You suggest some ideas [describe three of your typical Friday night activities] but tell them that you don't mind what you do, but that you've got to get out, after a busy week at university. Also ask your friend if you can spend the night at their place so you don't have to drive home.
2. You have come back from spending a weekend away. You text your friend and tell them where you went and describe three activities you enjoyed while on holiday. Tell your friend to look at your Facebook page to view the photos you've uploaded from the weekend. Then ask your friend how their weekend was and that you'd hope to catch up soon.

Participant text messages were composed on two different types of mobile phones, each installed with a pre-paid sim card purchased specifically for the study. A Nokia 1101 was used as the traditional multi-press mobile phone and an Apple iPhone 4 was used as the full keypad smartphone. To minimize extraneous influences, predictive text and auto-correction functions were disabled on both mobile phones. The order of use of phone type was systematically varied, that is, the first individual to participate was given the smartphone to send a text message in response to scenario one; the second individual to participate was given the Nokia mobile phone to send a text message in response to scenario one; the third individual to participate was given the smartphone to send a text message in response to scenario one and so on). The text message composed in response to scenario two was created on whichever device remained to be used. Thus, the confounding variable of order of device used was controlled because half the research participants started with the full keypad touchscreen smartphone and half the participants started with the alphanumeric multi-press mobile phone.

Each participant was given their first mobile phone and informed that they had 30 seconds to become familiar with the keypad and text messaging application (i.e., to reduce the effect of previous experience). The student was then given an instruction sheet containing the mobile phone number to which the text message was to be sent and scenario one, typed in a large, clear font. Participants were told that they had up to one minute to read the instruction sheet. Once the minute had lapsed or sooner if the student indicated readiness to start texting, students were told that they had exactly three minutes to create a text message in response to the scenario. When three minutes had elapsed, participants were directed to send the message to the number specified on the instruction sheet. The instruction sheet and relevant mobile phone for the alternate scenario were then given to the student, and an identical procedure was followed as with the first scenario.

Archiving and analysing text messages.

The smartphone messaging software had the capability of forwarding text messages to an email address. Thus, after each student texting session, messages were forward to an email address and subsequently collated into a word document. Student text messages composed on the alphanumeric multi-press mobile phone were manually typed from the phone screen into a word document because the text messaging application of the handset did not allow for email forwarding. Upon completion of 50 student texting sessions, the word document containing 100 text messages (i.e., 50 sent for each of two devices under identical conditions and having controlled for confounding variables). These 100 text messages were analysed for linguistic features and specific textisms. Initially, the features assessed were based on those identified by Thurlow and Brown (2003) and used by Ling and Baron (2007) in analysing instant messages and text messages sent by American college students. However, additional linguistic features emerged through analysis of the actual text messages. To allow for detailed comparison, a precise list of linguistic features was generated such that specific textisms were narrowly defined (e.g. lexical shortenings, acronyms and abbreviations) while other manifestations of digitalk were descriptively categorized (e.g., omitted capitalization and misspellings). Summarised and presented in Table 1, the linguistic features that emerged from the 100 text messages included message length (i.e., characters, words and sentences), emoticons, specific testisms (e.g., 2nite and omg), punctuation, capitalization and misspellings.

Table 1

Description of Linguistic Features Evident in Text Messages

Linguistic Feature	Description of Linguistic Feature
Length	Characters, words and sentences
Emoticon	Graphic or iconic representations of facial expressions and emotions
Specific Textism	Lexical shortening and lengthening, contraction, clipping, initials, symbol, homophone, unconventional spelling, acronym, abbreviation
Punctuation	Punctuation marks contributing to meaning including repurposed punctuation (e.g., an ellipsis in place of a period)
Capitalisation	Use of capital letters in personal pronouns, proper nouns and the first word of a sentence
Omitted Capitalisation	Absence of capital letters in personal pronouns, proper nouns and the first word of a sentence
Misspellings	Misspelled words not classified as textisms

Specific textisms found in the 100 text messages were analysed using a classification system adapted from previous studies (Plester et al., 2009; Thurlow & Brown, 2003). Summarized and presented in Table 2, specific textisms included shortening words (e.g., pics rather than pictures), lengthening words for effect (e.g., soooo rather than so), contractions (e.g., ur rather than you are), clippings (goin rather than going), initialisms (e.g., btw rather than by the way), symbols (e.g., @ rather than at), letter/number homophones (e.g., c rather than see), unconventional spelling (gurls rather than girls), acronyms (ASAP rather than as soon as possible) and indication of emotion and humour with letters (e.g., mwa to indicate the sound of a kiss).

Table 2

Categories and Examples of Specific Textisms Evident in Text Messages

Category	Example
Shortening	pics, Freo, hols, uni
Lengthening	helll, sooo, doooo, loooove, heeyy
Contraction	ur, urs, plz, hv
G-clipping	goin, gettin, doin
Other clipping	lemme, wanna, gotta, outta
Initialism	cbf, omg, btw, ceebs
Symbol	@, &, xx
Letter/number homophone	2nite, c, r, b, 4
Unconventional spelling	gurls, tonite, coz, fotos, kool,
Acronym	ASAP, FB, BBQ
Humour/emotion	hehe, haha, mwa, eek

The word document with 100 text messages was examined to determine the number of occurrences of each of eight linguistics features (i.e., characters, words, sentences, emoticons, punctuation, capitalization, omitted capitalization and misspelled word) and 11 specific textisms (as specified in Table 2). Analysis of text message length in terms of number of characters and words was determined using the word count feature in Microsoft Word. All other linguistic features and specific textisms for each of the 100 text messages were counted manually by a single rater and recorded in SPSS for Windows, with particular attention to ensuring messages sent by the same students (but with different devices) were correctly linked to allow for subsequent statistical comparisons.

Inter-rater reliability is defined as the degree to which raters give consistent estimates of the same phenomenon. To ensure the reliability of the linguistic features and specific textisms identified in text messages, five pairs of text messages, located using an online random number generator (Psychicscience.org, 2012), were re-coded by an alternate rater. The second ratings were compared with the original ratings. Each text message was coded in terms of eight linguistics features and 11 specific textisms for a total of 17 descriptors applied to each text message. Applying 17 descriptors to each of five re-coded text messages resulted in 85 potential points of rater agreement or disagreement for messages sent from either mobile phone (i.e., $17 \times 5 = 85$). Across the five re-coded smartphone text messages, there were 81 out of 85 agreements in ratings, that is, 95% consistency across two independent raters of the linguistic features and specific textisms in the text messages. With respect to messages sent on the multi-press mobile phone, there were 77 out of 85 agreements in ratings, that is, 91% consistency across two independent raters of the linguistic features and specific textisms in text

messages. Such high levels of inter-rater reliability suggest that the categorization and counting of the occurrences of linguistic features and specific textisms in text messages is consistent and, therefore, dependable (Gwet, 2010).

Results

Descriptive statistics (i.e., least, most, mean and standard deviation) for each of the linguistic features counted in the university students' text messages are presented in Table 3 for messages composed on the full keypad touchscreen smartphone and in Table 4 for messages composed on the alphanumeric multi-press mobile phone. The mean number of words used in the 50 smartphone messages was 43.06, the shortest message was 18 words and the longest message was 73 words. Whereas for multi-press text messages, the mean number of words was 32.00, the shortest message was 12 words and the longest message was 56 words. Average student use of specific textisms in smartphone messages was 2.76, with the lowest frequency at zero and the highest frequency at 22. For multi-press mobile phone messages, the mean specific textism use was 3.70, with the lowest frequency at zero and the highest frequency at 23. Omitted capitalization was more common in smartphone messages than in multi-press mobile phone text messages. The reverse pattern emerged for punctuation marks.

Table 3

<u>Linguistic Features of Text Messages send with a Full Keypad Touchscreen Smartphone</u>				
Linguistic Feature	Minimum	Maximum	Mean	Standard Deviation
Characters	82	359	206.40	61.21
Words	18	73	43.06	12.37
Sentences	1	9	4.48	1.98
Specific Textisms	0	22	2.76	3.61
Punctuation	0	14	6.60	3.06
Capitalisation	0	11	1.82	3.00
Omitted Capitalisation	0	14	4.92	3.22
Misspellings	0	4	0.80	1.07

Table 4

Linguistic Features of Text Messages send with a Multi-Press Keypad Mobile Phone

Linguistic Feature	Minimum	Maximum	Mean	Standard Deviation
Characters	56	249	151.48	48.86
Words	12	56	32.00	10.87
Sentences	1	9	3.68	1.71
Emoticons	0	3	0.28	0.61
Specific Textisms	0	23	3.70	4.83
Punctuation	0	12	4.56	2.72
Capitalisation	0	9	3.72	1.93
Omitted Capitalisation	0	6	2.34	1.47
Misspellings	0	1	0.26	0.44

Occurrences of specific textisms in messages composed on the touchscreen smartphone are presented in Table 5 and in Table 6 for messages composed on the multi-press mobile phone. The most common type of specific textism was the shortening of words (e.g., uni for university) with 50% usage in smartphone messages and 44% usage in multi-press mobile phone messages. On average, participating university students used 0.56 word shortenings in each smartphone message and 0.66 word shortenings in each multi-press mobile phone message. The second most frequently used specific textism was contractions (e.g., hv for have) with 34% of participants using this type of textism in their smartphone messages (mean 0.88) and 40% of participants using this type of textism in their multi-press mobile phone message (mean 1.38). Mean number/letter homophone usage in smartphone messages was 0.02 compared with 0.28 in multi-press mobile phone messages. Two percent of participating university students used number/letter homophones in their smartphone messages while 14% of participants used this textism type in their multi-press mobile phone messages.

Table 5

Specific Textisms in Messages send with a Full Keypad Touchscreen Smartphone

Textism Type	Min	Max	Mean	SD	Occurrence
Shortening	0	2	0.56	0.61	50%
Contraction	0	11	0.88	1.87	34%
Lengthening	0	1	0.10	0.30	10%
G-clipping	0	5	0.10	0.71	2%
Other clippings	0	3	0.40	0.73	28%
Initialism	0	1	0.06	0.24	6%
Symbols	0	1	0.08	0.27	8%
Number/letter homophones	0	1	0.02	0.14	2%
Unconventional spelling	0	3	0.18	0.56	12%
Acronyms	0	1	0.22	0.42	22%
Humour/emotion	0	2	0.14	0.45	10%

Table 6

Specific Textisms in Messages send with a Multi-Press Keypad Mobile Phone

Specific Textism	Min	Max	Mean	SD	Occurrence
Shortening	0	4	0.66	0.92	44%
Contraction	0	12	1.38	2.55	40%
Lengthening	0	1	0.02	0.14	2%
G-clippings	0	1	0.06	0.24	6%
Other clippings	0	3	0.28	0.57	24%
Initialisms	0	1	0.08	0.27	8%
Symbols	0	1	0.10	0.30	10%
Number/letter homophones	0	4	0.28	0.81	14%
Unconventional spelling	0	4	0.28	0.76	16%
Acronyms	0	2	0.36	0.53	34%
Humour/emotion	0	3	0.16	0.55	10%

Paired-sample t-tests established significant differences in some of the linguistic features of text messages composed on the two distinct types of mobile phones. As summarized and presented in Table 7, text messages composed with the full keypad touchscreen smartphone were longer (i.e., greater number of characters, words and

sentences) than text messages composed with the alphanumeric multi-press mobile phone. Only one category of specific textisms revealed significant difference in use; participating university students used significantly fewer number/letter homophones in smartphone messages than in multi-press mobile phone messages. Compared to multi-press mobile phone text messages, capitalization was significantly less common in smartphone messages. While punctuation marks were more common in text messages composed on the smartphone, misspelled words were also more frequent.

Table 7

Differences in the Linguistic Features of Text Messages sent via a Full Keypad Touchscreen Smartphone and a Multi-Press Keypad Mobile Phone

Linguistic Feature	Mean Occurrence (SD)	t	df	p
Characters	Smart 206.40 (61.21)	6.67	49	< 0.01
	Multi 151.48 (48.86)			
Words	Smart 43.06 (12.37)	6.59	49	< 0.01
	Multi 151.48 (48.86)			
Sentences	Smart 4.48 (1.98)	3.85	49	< 0.01
	Multi 3.68 (1.71)			
Number/letter homophones	Smart 0.02 (0.14)	-2.29	49	< 0.05
	Multi 0.28 (0.81)			
Capitalisation	Smart 1.82 (3.00)	-4.59	49	< 0.01
	Multi 3.72 (1.93)			
Omitted Capitalisation	Smart 4.92 (3.22)	5.79	49	< 0.01
	Multi 2.34 (1.47)			
Punctuation	Smart 6.60 (3.06)	6.94	49	< 0.01
	Multi 4.56 (2.72)			
Misspellings	Smart 0.80 (1.07)	3.23	49	< 0.01
	Multi 0.26 (0.44)			

Discussion of Results: Evolving Patterns of Digital Communication

Results of the current investigation suggest that the characteristics of mobile phones affect the linguistic features of text messages but, equally important, that communicative patterns endure regardless of mobile phone characteristics. Analysis of punctuation use, grammatical, lexical, stylistic and visual features of text messages composed on two different handsets revealed that this cohort of young adults was playfully manipulating language to sustain interesting conversations with communication partners (Lewis & Fabos, 2005). However, on average, participating university students

composed significantly longer messages when texting with the full keypad touchscreen smartphone compared with the alphanumeric multi-press mobile phone. Perhaps this is because typing on a full keypad is easier and faster and thus promotes increased word use. Curiously, participating university students used more capital letters in their multi-press text messages than in their smartphone text messages and, correspondingly, the smartphone text messages showed higher instances of omitted capitalisation. While capitalisation for both interfaces follows the same procedure (i.e., users press the shift key directly before selecting the letter to be capitalised), it is possible that the ease and speed with which participants create text messages on the smartphone negated focus on capitalisation. Indeed, it could be argued that capitalization is a convention with minimal influence on comprehension of communication intent. In this regard, the perceived need for and corresponding use of capitalization may be eroding in contemporary forms of text-based digital communication. Compared to the communicative limitations associated with the alphanumeric multi-press mobile phone, the full keypad touchscreen smartphone may be impacting on the conventions of text-based communication at a faster rate. If the objective is efficient communication, capitalization may be unnecessary.

Differences in messaging features may explain the finding that punctuation marks were more prevalent in text messages send from full keypad smartphones compared to multi-press mobile phones. Smartphone users were able to switch to a symbols menu with a single touch and insert a punctuation mark. Multi-tap mobile phone users must press multiple keys to access punctuation marks and this makes it more time consuming to incorporate punctuation into a text message. There were a few instances of repurposed punctuation within the corpora of text messages where participants utilised an ellipsis (i.e., two or more period marks in succession) to end a sentence instead of a single period mark. This use of repurposed punctuation was also found by Baron and Ling (2011) when examining American college students' instant messages which suggests that manipulation of standard punctuation symbols is not specific to young adults of a particular culture or geographical location but appears to be a universal trend among this age group, at least for texting in English. Both conventional (e.g., period at the end of a sentence) and creative (e.g. multiple exclamation marks) use of punctuation enhances communicative quality of text messages (e.g., indicates expression of emotion and alerts the receiver to the sender's communicative intent). In this regard, since the full keypad touchscreen smartphone allows for more efficient punctuation use, it also allows for more effective communication.

On average, participating university students used 2.76 specific textisms in messages sent from the full keypad touchscreen smartphone and 3.70 specific textisms in messages sent from the alphanumeric multi-press mobile phone. The difference was not statistically significant ($t = -1.80$, $df = 49$, $p = .078$). Text messages sent from the two distinct types of mobile phones were further compared in terms of differences in occurrences of eight specific textism conventions including shortening words, lengthening words for effect, contractions, clippings, initialisms, symbols, letter/number homophones, unconventional spelling, acronyms and indication of emotion and humour with letters (Table 2). In seven out of eight cases, there were no significant differences in occurrences of specific testisms in messages sent via a full keypad touchscreen smart phone or an alphanumeric multi-press mobile phone. However, participating university students used more number/letter homophones in multi-press text messages than in smartphone text messages. This may be due to the design of the alphanumeric keypad

where a number can be produced by holding down a specific key for two seconds, rather than having to switch to a separate numeric keypad as is the case with the smartphone. Nonetheless, in general, the touchscreen smartphone input method has not eliminated the use of specific textisms. Participating university students may choose to utilise textisms, regardless of input method, as a mechanism to enhance the communicative quality of their text messages and to conform to the specific language conventions associated with texting culture (Drouin, 2011).

Overall, shortenings (e.g. hols rather than holes) were the most frequently occurring specific textism in both smartphone text messages (i.e., occurred in 50% of messages) and multi-press mobile phone text messages (i.e., occurred in 44% of messages). Similar to shortenings, contractions (e.g. plz rather than please) were also relatively common regardless of texting device (i.e., occurred in 34% of smartphone messages and 40% of multi-press messages). Also similar to shortenings, clippings (e.g., wanna rather than want to), including g-clippings, were used in 30% of text messages regardless of type of mobile phone used by participating university students. Interestingly, number/letter homophones (e.g., b rather than be) were used sparingly, that is, in 14% of multi-press mobile phone text messages and 2% of messages sent with a full keypad touchscreen smartphone. Such a pattern of specific testisms is inconsistent with patterns reported by Coe and Oakhill (2011) where number/letter homophones were used most frequently by British preadolescent children when composing a text message with pen and paper. Many explanations are possible, for example, use of specific textisms may be influenced by texter age, culture and method of collecting text messages.

Grace, Kemp, Heritage Martin and Parrila (2012) examined the use of specific textisms in Australian university students through scenario-based text messages and naturalistic text message observation (where students provided several text messages recently sent from their mobile phones). Reportedly, accent stylisation (i.e., a word is spelled as it is pronounced in casual speech such as wiv for with and anuva for another) and homophones (e.g., r for are) were used most frequently, followed by shortenings and contractions. In contrast, the current investigation did not utilise the specific category of accent stylisations due to similarities between this category and other clippings where users clip the last letter from a word and replace it with the letter *a* (e.g. gonna for going to). If accent stylisations and other clippings were viewed as one category, specific textisms used by students in the current investigation would more closely reflect specific textisms identified by Grace et al., with the exception of number/letter homophones. Given the similarity of research samples (i.e., Australian university students), it may be that age, culture and education level are related to patterns of use of specific textisms in text messaging. Indeed, Australian English is characterised by shortenings of words (e.g., choccie bickie rather than chocolate biscuit; Kidd, Kemp, & Quinn, 2011). Since most texting is likely to occur within the same geographical area, it seems reasonable to assume that texting dialects would develop.

Patterns of use of linguistic features and specific textisms in the current corpus of text messages were similar to patterns reported by De Jonge and Kemp (2010), who also analysed the messages of Australian university students. Their study compared messages composed on an alphanumeric multi-press mobile phone with and without use of the predictive text application. With respect to specific textisms, accent stylisations, contractions and shortenings were most frequently used regardless of the predictive text application. Further, capitalisation was frequently omitted. Participating university

students' text messages in the current study also showed high frequencies of omitted capitalisation, regardless of the type of mobile phone used. Australian texting idiosyncrasies (i.e., *textialect*) may reflect some of the features of Australian English dialect.

Differences in patterns of textisms in the current study compared to other studies may be attributed to variation in textism classification systems. From a research perspective, a standard list of textism categories and common practices in analysing text messages would likely reduce differences in reported findings, although such standardization seems untenable since *textese* appears to be evolving rapidly with the continual emergence of new textisms and high variations in individual textism spellings (Coe & Oakhill, 2011; Kemp, 2010; Thurlow & Poff, 2011). In oral language, location affects dialect (e.g., America versus British versus Australian English). Location also appears to affect the linguistics features and specific textisms of text messages regardless of mobile phone input method (i.e., alphanumeric multi-press versus full keypad smartphone).

Indeed, the rate of change in patterns of human communication due to the rate of change in human communication technologies appears to be transforming the very nature of human interaction. Language conventions were once held sacred, perhaps because ridged expectations facilitated communication. However, contemporary technologies, embraced initially by adolescents and young adults, appear to be accelerating personalized and efficient communication rather than tradition and convention. While all living languages change over time, communication technologies have accelerating the rate of language change. Since many communication technologies are text-based, the change in written language conventions is particularly apparent. Results of the current investigation suggest that message quality may be enhanced by emerging technology (i.e., full keypad touchscreen smartphones) but not necessarily by use of standard written English language conventions.

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