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Abstract

The Net Generation has adopted textisms as shortcuts in electronic communication. Two studies investigated whether the reported use of textisms in daily electronic communication is related to the quality of writing. Seven hundred and eighteen young adults were queried about how often they used linguistic and contextual textisms, instant messaging, monthly cell minutes, and monthly text messaging. In Study 1 they wrote a formal letter to a company and in Study 2 they were asked to write both a formal letter and provide an informal writing sample on happiness. Textism use was quite low, a finding that was consistent with previous research on texting and instant messaging. The data reflected negative associations between reported textism use in daily communications and formal writing and positive associations between textisms use and informal writing. These relationships varied by gender and level of education, varying most strongly among those without a college education. The results are discussed in terms of Low-Road/High-Road Transfer of Situated Learning Theory.

Keywords

textisms, writing, English literacy, text messaging, instant messaging, low-road/high-road transfer of situated learning, situated learning, transfer of learning, net generation

When Barack Obama sent 2.9 million text messages to announce Joseph Biden as his vice presidential running mate in August 2008, he “branded himself as cutting edge” (Nielsen

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Mobile, 2008). Obama's choice of this communication modality reflects a trend that has seen text messaging become a major activity among Americans and particularly among the younger generation. According to CTIA, a wireless industry survey company (Mottl, 2008), 75 billion text messages were sent in June 2008, which represented a 160% increase from the same month just 1 year prior. Furthermore, according to a 2009 national survey (Nielsen Mobile, 2009) U.S. teens use their cell phones for texting more than talking, sending or receiving an average of 2,899 text messages a month compared to making or receiving only 191 cell phone calls. A national survey of teens (Harris Interactive, 2008) has even shown that 47% of the 2,089 nationally sampled teens could compose text messages blindfolded and that 13- to 17-year-olds used their phones more hours a day texting rather than talking.

Text messages often include shortcuts because they are restricted to 160 characters (hence the name "short messaging system" or SMS), are often composed on phones through multiple complex keystrokes, and because they have become part of common communication slang. For example, words are shortened (e.g., tues in place of Tuesday), letters are removed (e.g., goin for going), acronyms are inserted (e.g., LOL, IMHO), symbols are used to replace words (e.g., & instead of and), apostrophes are left out (e.g., dont for don't), sequences of characters such as coupling a colon, dash, and right parenthesis are used to create "emoticons" and express emotions (e.g., ☺), letters are capitalized to express strong emotions (e.g., I AM ANGRY), and special symbols flank words to intensify feeling (e.g., I **love** you).

Educators and the media have decried the use of these shortcuts, suggesting that they are causing youth, in what Thurlow (2003) labeled Generation Txt, to lose the ability to write acceptable English prose. In his article titled "From Statistical Panic to Moral Panic," Thurlow (2006) analyzed more than 100 media articles on this topic, finding that the vastly predominant tone was that text messaging was damaging to English literacy. A recent USA Today Magazine article (2008) entitled "Texting, Testing Destroys Kids' Writing Styles" appears to support these claims quoting Jacquie Ream author of *K.I.S.S.: Keep it Short and Simple* (2005) a book on writing: "These kids aren't learning to spell. They're learning acronyms and shorthand. Text messaging is destroying the written word. Students aren't writing letters; they're typing into their cell phones one line at a time. Feelings aren't communicated with words when you're texting; emotions are sideways smiley faces. Kids are typing shorthand jargon that isn't even a complete thought" (p. 8). In response to this, Crystal (2008), in his book, *Txtng: The Gr8 Db8*, said, "I do not see how texting could be a significant factor when discussing children who have real problems with literacy. If you have difficulty with reading and writing, you are hardly going to be predisposed to use a technology that demands sophisticated abilities in reading and writing. And if you do start to text, I would expect the additional experience of writing to be a help, rather than a hindrance" (p. 157).

A recent national sample of 12- to 17-year-olds, by the Pew American & Internet Life Project (Lenhart, Arafeh, Smith, & Macgill, 2008), appeared to lend support to this assertion, finding that in spite of the fact that 86% of the teens believed that writing well is important to success in life, 64% of them admitted that they had incorporated

some informal writing into their school writing with 50% removing capitalization and punctuation, 38% using shortcuts such as LOL, and 25% using emoticons. However, when asked about the effect of their electronic communication, replete with textisms, only 11% said it harmed writing while 73% felt it had no impact.

Empirical research on the impact of text messaging on English writing ability is limited. In an archival study, Massey, Elliott, and Johnson (2005) examined the quality of samples of standard language exams taken by all British 16-year-olds between 1980 and 2004 and concluded that the quality of writing had increased, inferring that electronic communication had not had a negative effect on writing ability. According to the British press (Fresco, 2005), "Fears that text messaging may have ruined the ability of teenagers to write properly have been shown to be unfounded after a 2-year study revealed that youngsters are more literate than ever before."

In the most systematic studies of the impact of textisms on English literacy, Plester, Wood, and Bell (2008) had 65 11-year-old children translate a text passage from English to textisms and from textisms to English. Their results showed that those who had the highest ratio of textisms to words—called textism density—when translating from English to textisms and fewer errors in translating from textisms to English had higher verbal reasoning scores, but there was no relationship between verbal reasoning and textisms translation errors. In contrast, Plester et al. (2008) found that frequent texters (three or more messages per day) scored significantly lower than infrequent texters and nontexters on a test of verbal and nonverbal reasoning. However, a multiple regression analysis indicated that only the textism ratio was significant in predicting verbal and nonverbal reasoning scores.

In their second study, Plester et al. (2008) studied a sample of 35 10- to 11-year-olds, using lengthier translation passages and found that the ratio of phonological textisms (e.g., using 2nite in place of tonight) was positively related to spelling and explained the most variance in spelling ability. In addition, those children who were at the highest level on a standardized reading test used the most textisms in the translation exercise.

In subsequent research, Plester and her colleagues (Plester, Wood, & Joshi, 2009) studied the impact of textisms with 88 10- to 12-year-olds by asking them to send text messages in response to 10 scenarios and found that girls used more textisms than boys and that, regardless of gender, textism density was positively related to word reading, vocabulary, and phonological awareness. Furthermore, those with higher textism density had better word reading ability after controlling for short-term memory, vocabulary, phonological awareness, and how long they had owned their cell phone. In addition, in a more detailed examination of the types of textisms, Plester et al. (2009) found that greater use of contractions (txt instead of text), g clippings (goin in place of going), symbols (emoticons plus single characters such as & in place of words), letter/number homophones (2nite), nonconventional spellings (fone), and accent stylization (e.g., elp instead of help) were related to better word reading scores while more misspellings ("are" in place of "our") were related to worse word reading scores. In addition, shortenings (bro instead of brother), g clippings, symbols, and accent stylizations were positively related to spelling while, once again, misspellings were negatively related to spelling. As Plester and Wood (2009) concluded,

"It is clear also that it [texting] does not contribute to the demise of pre-teen children's literacy" (p. 18).

Parallel research has been done examining the content of instant messaging (IM) that has similarities to text messaging in that they are both done interactively and often use a variety of textisms. The major difference is that there are no limits on IM characters as there are with text messages. In a recent study, Tagliamonte and Denis (2008) sampled more than one million words of natural, unmonitored instant message words from 72 teens between 15 and 20 years old and found that the use of "emotional forms" common to IM occurred in only 2.44% of all IM words, which was in line with previous studies of both teens and young adults (Baron, 2005; Ling & Baron, 2007; Baron, 2008). The most common emotional textisms included the use of "haha" as an interjection (1.47%) followed by LOL (0.41%) and others that occurred in less than .2% of the words. Overall, Tagliamonte and Denis found that the use of LOL decreased with age while the use of haha, the most common emotional textism, increased with age. In a separate analysis, they found that "you" was replaced by "u" 8.6% of the time while capital "I" was replaced by lowercase "i" 74% of the time and that the decision to make these replacement was a "stylistic" choice where an IMer either used the replacement or did not essentially 100% of the time. In addition, researchers have consistently found that females use textisms more than males (Ling, 2005; Plester et al., 2009).

The clear media message that text messaging is damaging writing abilities (Thurlow, 2006) suggests that when youth write using language shortcuts they are developing bad writing habits and will be unable to successfully write Standard English prose. Saloman and Perkins (1989) proposed a Low-Road/High-Road Theory of Transfer of Learning where low-road transfer suggests a learned, somewhat automatic transfer of skills when two tasks are closely related to each other, while high-road transfer suggests that previously acquired skills are used with more conscious intent or effort. Furthermore, Brown, Collins, and Duguid (1989) suggested that "situated learning" or learning by doing leads to unintentional transfer of skills. Taken together, these two theories suggest that those people who use more shortcuts in their everyday writing would be predicted to transfer those "skills" to Standard English writing that would, in turn, lead to diminished writing abilities. Furthermore, more low-road transfer may be seen when the task is "similarly situated" to informal text messaging, thus leading to worse informal writing. In contrast, when the task is dissimilar to informal text messaging, the theories would predict more high-road transfer suggesting less negative impact on writing.

The present study provides both an extension and expansion of the scant previous research. First, rather than relying on standardized tests of reading, vocabulary, spelling, and other language-related activities, the current study examines actual writing samples, including a brief formal writing sample and a brief informal writing sample. The formal writing sample was expected to tap into formal language skills such as grammar and spelling, but the informal writing sample was expected to index less structured language uses such as emotional expression. Second, unlike Plester's studies (Plester et al., 2009; Plester et al., 2008) that involved either a translation exercise to identify textism density or a text messaging response to specific scenarios, this study directly queried participants about

their use of different textisms in their everyday electronic communication. Third, while earlier studies of text messaging have looked at preteens and teens, the current research study examined writing abilities of young adults who are, for the most part, experienced texters. Finally, the study investigated young adults who varied in college experience to determine the role schooling might play as a mediator in the impact of textisms on writing.

Based on prior research and the Low-Road/High-Road Transfer of Situated Learning Theory, the following hypotheses and research questions are examined in this study.

Hypothesis 1: Young female adults will report using textisms more than will young male adults.

Hypothesis 2: Those young adults who report using more textisms in their electronic communication will produce better informal writing but worse formal writing due to the similarities between informal writing and text messaging and the disparity between formal writing and text messaging.

Research Question 1: How will the relationship of reported textism use in electronic communication and writing vary as a function of education?

Research Question 2: How will the relationship of the reported use of textisms in electronic communication and writing differ between formal and informal writing?

Hypothesis 3: The actual use of textisms in writing will be low.

Research Question 3: How will the use of textisms on writing vary as a function of college education among young adults, gender of the participant, and type of writing (formal vs. informal)?

Method

Participants

This report combines data from two nearly identical research studies. Each was part of a larger study with relevant questions in common between the two studies investigated in this report. In both studies, convenience sample participants 11 years of age and older were asked to take an online, anonymous survey. This report examines only those participants between the ages of 18 and 25 who were combined to give sufficient samples to make relevant comparisons.

Study 1 participants. In Study 1, 1,319 participants participated including 335 18- to 25-year-olds; 38% males and 62% females. In terms of ethnic background, the sample represented the Los Angeles basin population with a mixture of Asians (14%), African Americans (14%), Whites (30%), Latino/as (38%), and other/mixed background (5%). Educationally, 10% had not taken any college courses, 65% had some college, and 25%

held a college degree. Only those participants who completed the entire survey were included in the sample.

Study 2 participants. In Study 2, the 1,226 participants included 383 18- to 25-year-olds, 43% males, and 57% females; and 10% Asians, 20% African Americans, 27% Whites, 38% Latino/as, and 5% other or mixed background. Educationally, 18% had not taken any college courses, 66% had some college, and 16% held a college degree. Again, only those participants who completed the entire survey were included in the sample. There were no demographic differences between participants in the two studies in terms of gender: $\chi^2(1, N = 718) = 1.79, p > .05$; or ethnicity: $\chi^2(4, N = 721) = 6.69, p > .05$. There was, however, a significant difference in education level between studies, $\chi^2(2, N = 718) = 13.86, p < .001$; Cramer's $V = .14$ (Nolan & Heinzen, 2007), with Study 1 having more college educated participants.

Measures

The larger surveys included a variety of measures, but for the current report only a subset was used to address the hypotheses.

Reported use of communication tools. Participants were asked to indicate approximately how many minutes per month they used a cell phone and approximately how many text messages they sent per month. For each of these, any supplied number greater than three standard deviations above the mean was truncated to exactly that whole number. Overall, after correcting for these overly large responses, participants talked on their cell phone an average of 706.21 minutes per month (range = 0 to 4,013; $SD = 736.23$) and sent a mean of 588.69 text messages per month (range = 0 to 3,474; $SD = 839.58$).

Formal writing sample. In both Study 1 and 2, each subject was asked to write a response to the following prompt: "Pretend that you want to complain to a company from which you bought a product. Write a letter to the company manager complaining about the quality of service that you received or the product itself and what you want them to do about it." Ample space was available, and formal writing samples considered in the following analyses averaged 327.41 ($SD = 348.24$) characters for Study 1 and 327.46 ($SD = 367.17$) for Study 2.

Informal writing sample. In Study 2, participants were also asked to write a response to the following prompt: "Please describe in detail what it feels like to be unhappy. What should a person do to become happy again? What have you done in the past when you were unhappy?" Informal writing samples considered in analyses averaged 260.33 ($SD = 368.52$) characters or approximately 67 characters fewer than the formal writing samples.

Reported general daily use of textisms. Participants were asked how often they used a variety of textisms in their daily electronic communication including e-mail, text messaging, and IM. The types of textisms included four linguistic textisms: (a) acronyms such as LOL or L8R; (b) lowercase "i" in place of uppercase I as a personal pronoun; (c) removing apostrophes from contractions such as "dont" in place of don't; and (d) shortening words such as using "tht" in place of that or "u" in place of you. In addition, three contextual

textisms were included that indicated feelings and emotions including (a) inserting emoticons or smileys such as ☺, (b) using special characters to denote emotional states such as *frown* or ::hug::, and (c) using all capital letters to denote strong emotions such as I AM ANGRY. Participants rated their use of each textism in their typical electronic communication on a 1 to 5 scale including *never*, *rarely*, *sometimes*, *often*, and *very often*. These seven broad categories of textisms were chosen to represent the typical types of shortcuts used in daily communication. No attempt was made to discriminate more finely between textisms such as separating shortened words into smaller groupings including contractions, g-clippings, homophones, accent stylizations (Plester et al., 2009).

The validity of the reported daily textism measurement was assessed in a variety of ways. First, the total score for the four linguistic textisms and the three contextual textisms was computed. Both total reported linguistic and contextual textism use showed a wide variation in scores with a mean near the center of the possible range and low skewness (Linguistic textisms $M = 10.68$, $SD = 5.11$, skewness = .187 with a possible range from four to 20; contextual textisms $M = 8.27$, $SD = 3.82$, skewness = .234 with a possible range of three to 15), indicating that participants were not simply overstating their reported use of textisms to appear more in line with young people's texting behavior. Second, both total scales showed acceptable Cronbach's α scores of .84 and .79 for the linguistic and contextual totals, respectively. Third, the actual number of linguistic textisms used in each writing sample was correlated ($p < .05$) with the reported total linguistic textism score ($r = .17$, $p < .001$) and not with the reported total contextual textism score, while the actual number of contextual textisms used in the writing samples was only correlated with the reported total contextual textism score ($r = .12$, $p < .001$).

Procedure

Both study surveys were posted on the Survey Monkey Web site and received IRB approval. Study 1 data were collected in January 2008 and Study 2 data were collected in February 2008. For both studies, each student in an upper division general education course was asked to find 10 participants more than 10 years old to complete the survey. Each participant 18 years of age and older completed a consent form, and those participants between 11 and 17 years old were required to have one parent provide online consent. No attempts were made to verify the parental online consent through any third-party service. Participants were compensated by an optional lottery for gift certificates. If they opted to be part of the lottery, they provided an e-mail address that was removed from the rest of the data to preserve anonymity. In Study 2, the order of formal and informal writing samples was counterbalanced, and there was no significant difference in the writing sample ratings (see Table 1 for scoring rubric) depending on order of presentation; formal first $t(381) = 1.059$, $p > .05$; informal first $t(252) = 1.04$, $p > .05$. In Study 2, when the informal writing sample appeared first, it was significantly longer than when it appeared second; $t(381) = 3.75$, $p < .001$, effect size $rY\lambda = .19$ (Rosnow & Rosenthal, 1996). Based on this difference, writing sample order was partialled out of all analyses involving informal writing.

Table 1. Writing Sample Scoring Rubric

Score	Required Content
<p><i>Score of 6—Superior:</i> A 6 essay is superior writing, but may have minor flaws. A typical essay in this category:</p> <ul style="list-style-type: none"> Addresses the topic clearly and responds effectively to all aspects of the task Demonstrates a thorough critical understanding of the passage in developing an insightful response Explores the issues thoughtfully and in depth Is coherently organized and developed, with ideas supported by apt reasons and well-chosen examples Has an effective, fluent style marked by syntactic variety and a clear command of language Is generally free from errors in grammar, usage, and mechanics 	
<p><i>Score of 5—Strong:</i> A 5 essay demonstrates clear competence in writing. It may have some errors, but they are not serious enough to distract or confuse the reader. A typical essay in this category:</p> <ul style="list-style-type: none"> Clearly addresses the topic, but may respond to some aspects of the task more effectively than others Demonstrates a sound critical understanding of the passage in developing a well-reasoned response Shows some depth and complexity of thought Is well-organized and developed, with ideas supported by appropriate reasons and examples Displays some syntactic variety and facility in the use of language May have a few errors in grammar, usage, and mechanics 	
<p><i>Score of 4—Adequate:</i> A 4 essay demonstrates adequate writing. It may have some errors that distract the reader, but they do not significantly obscure meaning. A typical essay in this category:</p> <ul style="list-style-type: none"> Addresses the topic, but may slight some aspects of the task Demonstrates a generally accurate understanding of the passage in developing a sensible response May treat the topic simplistically or repetitively Is adequately organized and developed, generally supporting ideas with reasons and examples Demonstrates adequate use of syntax and language May have some errors, but generally demonstrates control of grammar, usage, and mechanics 	
<p><i>Score of 3—Marginal:</i> A 3 essay demonstrates developing competence, but is flawed in some significant way(s). A typical essay in this category reveals <i>one or more</i> of the following weaknesses:</p> <ul style="list-style-type: none"> Distorts or neglects aspects of the task Demonstrates some understanding of the passage, but may misconstrue parts of it or make limited use of it in developing a weak response Lacks focus, or demonstrates confused or simplistic thinking Is poorly organized and developed, presenting generalizations without adequate and appropriate support or presenting details without generalizations Has limited control of syntax and vocabulary Has an accumulation of errors in grammar, usage, and mechanics that sometimes interfere with meaning 	
<p><i>Score of 2—Inadequate:</i> A 2 essay is seriously flawed. An essay in this category reveals <i>one or more</i> of the following weaknesses:</p> <ul style="list-style-type: none"> Indicates confusion about the topic or neglects important aspects of the task 	

(continued)

Table 1. (continued)

Score	Required Content
	Demonstrates very poor understanding of the main points of the passage, does not use the passage appropriately in developing a response, or may not use the passage at all
	Lacks focus and coherence, and often fails to communicate its ideas
	Has very weak organization and development, providing simplistic generalizations without support
	Has inadequate control of syntax and vocabulary
	Is marred by numerous errors in grammar, usage, and mechanics that frequently interfere with meaning
<i>Score of 1—Incompetent:</i>	A 1 essay demonstrates fundamental deficiencies in writing skills. A typical essay in this category reveals <i>one or more</i> of the following weaknesses:
	Suggests an inability to comprehend the question or to respond meaningfully to the topic
	Demonstrates little or no ability to understand the passage or to use it in developing a response
	Is unfocused, illogical, or incoherent
	Is disorganized and undeveloped, providing little or no relevant support
	Lacks basic control of syntax and vocabulary
	Has serious and persistent errors in grammar, usage, and mechanics that severely interfere with meaning

Results

Writing Sample Ratings

Each writing sample was rated on a rubric created to score the campus Graduation Writing Exam (GWE). The scale produced scores from 1 to 6 based on specific criteria displayed in Table 1. Each writing sample was scored independently by two college seniors with either a major or subspecialization in English and then compared to reconcile any ratings that differed by more than one point. After reconciliation, the interrater reliabilities were extremely high for all three writing samples¹. The correlation between scores for those who completed both writing samples was .68 ($p < .001$).

Formal and informal writing samples with ratings of 1 or 1.5 (a rating of 1 from one rater and 2 from the other would yield an average 1.5 rating) were removed from all further analyses as these low-rated formal writing samples included substantially fewer characters (Study 1: $M = 40.56$; $SD = 48.34$; Study 2: $M = 64.75$; $SD = 56.79$) compared to characters in formal sample ratings between 2 and 6 (Study 1: $M = 346.05$; $SD = 289.01$; Study 2: $M = 456.25$; $SD = 292.30$). Similarly, the informal writing samples with 1 and 1.5 ratings also had substantially fewer characters ($M = 41.57$; $SD = 64.14$) compared to characters in informal writing samples with ratings between 2 and 6 ($M = 371.43$; $SD = 264.57$). The vast majority of these low ratings were essentially short, nonresponsive answers.

Removing these low-rated writing samples yielded a total remaining sample of 495 participants completing formal writing samples (238 from Study 1 and 257 from Study 2)

and 254 participants completing informal writing samples from Study 2. Of those who had their informal writing removed, 65% also had their formal writing sample removed. On the 6-point rating scale, formal writing sample ratings averaged 3.86 ($SD = 1.05$) in Study 1 and 3.67 ($SD = 1.03$) in Study 2, which did not differ significantly, $t(493) = 1.80, p > .05$. Based on the lack of difference between ratings of formal writing samples in the two studies, they were combined to form a larger sample. In Study 2 informal writing sample ratings averaged 3.26 ($SD = .92$).

Demographic Differences in Formal and Informal Ratings

There were no significant differences in ratings between males ($M = 3.86; SD = 1.05$) and females ($M = 3.67; SD = 1.02$) for the formal writing samples, $t(493) = 0.53, p > .05$. However, females had significantly higher informal ratings ($M = 3.37; SD = .90$) than did males ($M = 3.08; SD = 1.04$); $F(1, 251) = 5.91, p < .05$; partial eta-square (η_p^2) = .023 (Tabachnick & Fidell, 1989). (Note: F tests were used for informal comparisons with writing sample order used as a covariate.) Although there was no significant difference between education levels on formal writing ratings, $F(2, 492) = 1.61, p > .05$, the college degree participants did have higher formal writing sample ratings ($M = 3.91; SD = 1.12$) than did those with some college ($M = 3.74; SD = 1.02$) and no college ($M = 3.62; SD = 1.03$). In Study 2, there was a significant difference between education levels for informal sample ratings with college students ($M = 3.44; SD = 1.08$) and those with some college ($M = 3.34; SD = .91$) having significantly higher scores than those with no college ($M = 2.80; SD = .58$) based on Tukey's B Test; $F(2, 250) = 7.25, p < .001$; $\eta_p^2 = .051$. Based on these differences all analyses were completed separately for each educational group.

Educational Differences in Use of Communication Tools and Media

Participants were compared for both studies combined to assess educational differences in the reported use of textisms in typical communications. According to Tukey's B Test, those with some college education reported using acronyms significantly more often than those with no college education, with those participants holding a college degree not significantly different from either group.² For the use of lowercase "i," those with some college and those with a college degree did not differ significantly but reported using lowercase "i"s more often than those with no college education.³ The overall reported use of linguistic textisms also differed by educational level with those participants with some college reporting using them more often than those with a college degree and no college education who did not differ significantly.⁴ The reported use of simultaneous IMs both showed those with no college having significantly more simultaneous IM conversations than those with a college degree and those with some college, which did not differ significantly.⁵

Gender Differences in Use of Communication Tools and Media (Hypothesis 1)

Overall, there were many significant differences between males and females on the reported use of communication tools and media as seen in Table 2 for all males and females

Table 2. Means, Standard Deviations (in Parentheses), Significant Differences, and Partial Eta Squared ($[\eta_p^2]$ in Brackets) on Use of Communication Tools and Media Between All Males and Females

	All Participants	
	Males <i>n</i> = 286	Females <i>n</i> = 423
Textisms and Media Usage		
Acronyms	—	—
Lowercase "i"	3.24 (1.48)	3.55** (1.42) [$\eta_p^2 = .011$]
No apostrophes	3.19 (1.51)	3.39* (1.48) [$\eta_p^2 = .004$]
Shortened words	2.96 (1.61)	3.34** (1.58) [$\eta_p^2 = .014$]
Smilies ☺	3.16 (1.45)	3.85*** (1.31) [$\eta_p^2 = .057$]
Emotional states	3.14 (1.45)	3.51*** (1.53) [$\eta_p^2 = .014$]
ALL CAPS	2.66 (1.43)	3.22*** (1.44) [$\eta_p^2 = .035$]
Total linguistic textisms	11.58 (4.63)	12.46** (4.26) [$\eta_p^2 = .009$]
Total contextual textisms	8.97 (3.43)	10.57*** (3.42) [$\eta_p^2 = .050$]
Monthly cell phone use	—	—
Monthly text messages	674.67 (923.48)	813.42* (986.35) [$\eta_p^2 = .005$]
Simultaneous IMs	—	—

Note: Nonsignificant differences are indicated by dashed lines.

* $p < .05$. ** $p < .01$. *** $p < .001$.

and Table 3 for males and females separated by educational level. In general, as is evident in Table 2, when combined across educational level, females reported using significantly more textisms than did males except for the reported use of acronyms and reported sending significantly more text messages monthly than did males. These results held for those with some college education but with smaller sample sizes; the only significant gender differences for those with no college and a college degree were for the reported use of smilies and designation of emotional states. In addition, women with a college degree reported sending more text messages than did men with a college degree.

Relationship Between Textisms and English Literacy (Hypothesis 2 and Research Questions 1 and 2)

Hypothesis 2 predicted, based on research by Plester and her colleagues (Plester et al., 2008, 2009) and others (Massey et al., 2005), plus the Low-Road/High-Road Transfer of Situated Learning Theory, that there would be a significant positive relationship between reported textism use in daily electronic communication and informal writing and a negative correlation for formal writing. Pearson correlations were computed separately between the writing sample ratings and each dependent variable for each education group and, based on the data in Table 3, where appropriate, gender was included as a covariate in a

Table 3. Means, Standard Deviations (In Parentheses), Significant Differences, and Effect Sizes [η_p^2 in Brackets] on Use of Communication Tools and Media Between Males (M) and Females (F) With Different Levels of Education

	No College		Some College		College Degree	
	M n = 43	F n = 57	M n = 197	F n = 270	M n = 46	F n = 96
Textisms and Media Usage						
Acronyms	—	—	—	—	—	—
Lowercase "i"	—	—	3.28 (1.46)	3.71*** (1.37) [.022]	—	—
No apostrophes	—	—	3.16 (1.50)	3.51** (1.47) [.013]	—	—
Shortened words	—	—	2.89 (1.61)	3.50*** (1.55) [.036]	—	—
Smilies ☺	3.16 (1.51)	3.81* (1.43) [.046]	3.22 (1.44)	3.85*** (1.33) [.049]	2.89 (1.51)	3.85*** (1.20) [.108]
***Emotional states**	—	—	3.22 (1.43)	3.55* (1.54) [.011]	2.72 (1.54)	3.41** (1.48) [.045]
ALL CAPS	—	—	2.65 (1.45)	3.35** (1.41) [.055]	—	—
Total linguistic textisms	—	—	11.62 (4.69)	12.98*** (4.02) [.024]	—	—
Total contextual textisms	9.12 (3.08)	10.30* (3.67) [.029]	9.10 (3.49)	10.75*** (3.43) [.053]	8.24 (3.45)	10.24*** (3.23) [.075]
Monthly cell phone use	—	—	—	—	—	—
Monthly text messages	—	—	—	—	349.57 (476.35)	734.82* (928.49) [.046]
Simultaneous IMs	—	—	—	—	—	—

Note: Nonsignificant differences are indicated by dashed lines.

* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 4. Correlations and Partial Correlations^a Between Dependent Variables and Formal (Study 1 and Study 2 Combined) and Informal (Study 2) Writing Sample Ratings Separated by Education Level

Textisms and Media Usage	All Participants		No College		Some College		College Degree	
	Formal	Inf ^b	Formal	Inf ^b	Formal	Inf ^b	Formal	Inf ^b
Acronyms	—	—	—	—	—	—	—	—
Lowercase "i"	—	—	—	—	—	-.15*	—	—
No apostrophes	—	—	—	-.27*	—	—	—	—
Shortened words	-.14***	—	-.31***	—	-.12	—	—	—
Smilies ☺	.08*	—	-.31**	—	-.12*	—	—	—
Emotional states	—	—	—	.28*	—	—	—	—
ALL CAPS	—	—	—	.26*	—	—	—	—
Total Linguistic Textisms	-.10**	—	—	—	-.11*	—	—	—
Total contextual textisms	—	—	—	.35*	—	—	—	—
Monthly cell phone use	—	—	—	—	—	—	—	—
Monthly text messages	—	.12*	—	—	-.18*	.18*	—	—
Simultaneous IMs	-.12*	—	—	—	-.10*	—	-.21*	—

Note: Nonsignificant correlations are indicated by dashed lines.

^aWhen significant gender differences existed partial correlations were used with gender as a covariate. Writing sample order was used as a covariate for informal writing correlations.

^bInf = Informal writing sample on happiness.

* $p < .05$. ** $p < .01$. *** $p < .001$.

partial correlation. For all correlations with informal writing sample ratings, writing sample order was included as a covariate due to its impact on length. Table 4 displays these correlations for both formal (Studies 1 and 2 combined) and informal writing samples (Study 2) across all dependent variables for all participants and those with varying education levels.

Linguistic textisms. Those without any college education and those with some college who reported using more shortened words in their electronic communications had worse formal writing. This effect was not significant for those with a college degree. In addition, using more linguistic textisms in electronic communications overall was related to worse formal writing for those with some college education. Furthermore, the reported use of lowercase "i" was related to worse informal writing for those participants with some college education while leaving out apostrophes was related to better informal writing for those with no college education. Reported use of linguistic textisms was unrelated to writing ability for those with a college degree.

Table 5. Percentage of Participants Who Used One or More Types of Textisms in Formal (Study 1 and Study 2 combined) and Informal (Study 2) Writing Samples

Textisms	Formal	Informal
Acronyms	1.54%	0.00%
Lowercase “i”	18.89%	12.57%
No apostrophes	6.29%	11.78%
Shortened words	3.36%	2.36%
Smilies ☺	0.00%	0.00%
Emotional states	0.14%	0.00%
ALL CAPS	4.63%	4.97%
Language textisms	24.06%	21.47%
Context textisms	4.63%	4.97%
Any textism	26.90%	25.30%
Mean number of textisms ^a	$M = 2.66^b$ ($SD = 2.46$)	$M = 2.25$ ($SD = 2.11$)

^aIncludes only those who used at least one textisms in formal ($n = 193$) and informal ($n = 96$) writing samples.

^bThere was no significant difference between the mean number of textisms used by textisms users in the formal writing samples in Study 1 ($M = 2.64$; $SD = 2.27$) and Study 2 ($M = 2.68$; $SD = 2.67$), $t(191) = 0.11$, $p > .05$.

Contextual textisms. For formal writing, more reported use of smilies was related to better formal writing for all participants and those with no college education, and more reported use of emotional states as well as total use of contextual textisms was related to better informal writing for those with no college education. Reported use of contextual textisms was not related to writing quality for any other group.

Communication use. Those participants with some college who reported sending more text messages demonstrated worse formal writing but better informal writing. Across all participants sending more text messages was related to better informal writing. In addition, those participants with some college or a college degree who reported holding more simultaneous instant message conversations evidenced worse formal writing.

General Use of Textisms (Hypothesis 3 and Research Question 3)

A research question queried whether textisms would appear in either formal or informal writing samples. Although writing samples were not penalized for the appearance of textisms, there were no explicit instructions about their use or lack of use. Table 5 presents the percentage of participants who used each textism type in both formal and informal writing samples. It is clear from the data in Table 5 that while linguistic textisms were used by 1 in 5 participants, contextual textisms were rarely used except for 1 in 20 who made a statement in all capital letters to show strong emotion. The most common linguistic textisms included lowercase “i” followed by leaving out apostrophes. Very few participants used the other linguistic textisms, and those participants who used any textisms at all in their writing sample inserted an average of slightly more than two and a half textisms per writing

sample. Interestingly, those who did use textisms inserted more of them in the formal writing sample than the informal one although this difference was not statistically significant; $t(287) = 1.40, p > .05$. This difference may reflect the fact that formal writing samples were an average of 67 characters longer than informal ones.

Gender and educational differences. In Study 1 more females (6.7%) used all capital letters than did males (0.8%); $\chi^2(1, N = 334) = 6.45, p < .05$; phi (ϕ) = .011 (Nolan & Heinzen, 2007); however, in Study 2 there were no gender differences in the use of any textisms in either formal or informal writing. In addition, more participants with no college (32.4%) used textisms in their formal writing than did those with some college (24.3%) or those with a college degree (13.3%); $\chi^2(2, N = 379) = 6.36, p < .05$; Cramer's $V = .129$. Although not statistically significant, the same pattern was shown with the percentage using textisms in informal writing (no college = 30.9%; some college = 26.0%; college degree = 15.0%); $\chi^2(2, N = 382) = 4.57, p = .102$.

Discussion

This study investigated whether the reported daily use of textisms in electronic communication is related to the quality of either informal or formal writing. Hypothesis 1 examined gender differences and found that young female adults reported using more linguistic and contextual textisms than did young male adults. This held for all participants and primarily for those with some college education. For those with no college or a college degree and small samples, females reported using more contextual textisms (smilies and highlighting emotional states) than did males and although not significant, all other differences showed females reporting using more textisms than did males. Both males and females reported using equal cell phone minutes for speaking, but females in general, and those with a college degree in particular, reported sending more text messages. Females also equal participating in more simultaneous instant message conversations for those with some college and no college. These results match those of Lenhart et al. (2008), Plester et al. (2009), and Ling (2005). Differences in frequency of texting between men and women might be related to the psychosocial functions served by SMS for the sexes. Research on adolescent SMS users tends to show that girls use texting predominantly to maintain relationships, while boys use texting to convey concrete information (Reid & Reid, 2005). The former function of texting could require more time spent texting and/or more messages to achieve.

Hypothesis 2 predicted, based on research by Plester and her colleagues (Plester et al., 2008, 2009) and others (Massey et al., 2005), plus the Low-Road/High-Road Transfer of Situated Learning Theory, that there would be a significant positive relationship between reported textism use in daily electronic communication and the quality of informal writing and a negative correlation with the quality of formal writing. Two further research questions asked about whether these relationships differed by education or type of writing (formal or informal). For formal writing, more reported overall use of total linguistic textisms and specifically greater reported use of shortened words were related to *worse* formal writing, but greater reported use of smilies was related to *better* formal writing. In addition,

those participants who reported holding more simultaneous IMs showed worse formal writing. Educationally, those with no college showed the negative effect of shortened words and the positive effect of smilies while those with some college showed a negative effect of shortened words and total linguistic textisms plus a negative impact of sending more text messages and having more simultaneous IMs. For those with a college degree, the only significant relationship was that those who reported having more simultaneous IMs had worse formal writing. The negative impact of linguistic textisms supports the Low-Road Theory of Situated Learning, suggesting perhaps that the use of more linguistic textisms in daily writing might be carried over into actual, albeit simulated, writing samples. These results also contradict the empirical research studies by Plester et al. (2008) and Plester et al. (2009) as well as the archival results presented by Massey et al. (2005), particularly for those with no college or some college. It should be noted that the work by Plester and her colleagues was done with a different task and younger participants than in the current study. These differences in the studies' designs and populations may account for the different results. In contrast, however, the use of smilies was related to better writing, particularly for those with no college education. This finding supports the work by Plester and her colleagues.

For informal writing the results were, by and large, the opposite of those for formal writing. Across all participants, sending more text messages was related to *better* writing, supporting the Low-Road Theory of Situated Learning. By educational level, for those with no college, more reported daily linguistic and contextual textisms were also related to *better* informal writing. For those with some college, a greater reported use of lowercase "i" was related to worse informal writing while sending more monthly text messages was related to better informal writing. For those with a college degree there were no relationships between textisms and informal writing. These results, at least for those participants with no college, did support previous empirical studies showing that those who used more linguistic and contextual textisms produced better informal writing.

These results suggest that there is a difference in the relationship between writing and textisms for formal versus informal writing as well as a difference between those with differing levels of education. There is a negative impact in writing a formal letter but a positive relationship with informal writing. One possible explanation is that when someone is writing a formal letter, in this case to complain about a defective purchase, having his or her typical daily communication replete with linguistic textisms and not having a college degree may make it difficult to express the complaint. However, when allowed to write about happiness—an emotional topic—the participants with no college education actually benefitted from having their daily conversations incorporate both linguistic and contextual textisms. In essence, it may be that some young people are better able to "code switch" depending on the audience or, in this study, the formality of the writing task (Androutsopoulos, 2006; Ferreira da Cruz, 2008; Paolillo, 2001). This may suggest that for these participants without a college education, the ability to use *any* linguistic or contextual textisms—which are both shorter ways of expressing larger chunks of information—may allow for increased daily writing "output" which in turn may help the participant with less education produce a better product.

Finally, Hypothesis 3 examined how many participants used textisms in formal and informal writing exercises. Recall that in this study the participants were not told explicitly to use or avoid textisms in their writing. Indeed, one in four did use between two and three textisms in their writing samples, and those with more education used fewer. Again, this suggests that while the use of textisms was minimal—and comparable to prior research (Tagliamonte & Denis, 2008)—young adults with less education use them more frequently, which then may hinder their formal writing by making it more difficult to produce a solid formal letter. In contrast, the fact that less educated participants used more textisms in their informal writing may indicate that they were able to express more thoughts by using these shortcuts and therefore produce a better written commentary on happiness.

In summary, it is clear that prior research on the impact of textisms on writing was, for the most part, not supported except for the case of a short informal writing sample on happiness. Again, however, the prior research was completed with much younger participants who, for the most part, may be more avid texters and better suited to adapt their texting style of writing to the vignette situations in Plester et al.'s (2009) research paradigm. For those with no college education, writing a formal letter may be negatively impacted by the "loose," informal style used in daily, textisms-laden writing.

Strengths and Limitations

The current research required the production of two writing samples while earlier research either used archival essay grades; standardized reading, vocabulary, and other linguistically based measures; or short texting exercises. Furthermore, unlike Plester et al. (2008) and Plester et al. (2009), a reported assessment of the participants' texting use in everyday electronic communication was used to measure typical textism production rather than inferred from generation of textisms on texting-related tasks. It should be noted, however, that the writing samples were produced in an artificial situation, as part of an online, anonymous survey and may not represent true writing in a classroom environment. Additional work should be done to relate the daily use of textisms to a variety of actual classroom writing assignments to better assess the nature of their relationship.

Next, although data indicated that the measure of reported daily use of textisms appeared to be valid, a better approach would be to transcribe students' text messages, instant messages, and e-mail and directly observe their daily use of textisms. Furthermore, participants were asked to recall the number of text messages they had sent as well as the number of minutes they used their cell phone for telephone calls during the previous month. Their recall could be faulty and a tally of phone call minutes, and text messages sent and received, could be made using the participants' phone bills, which would provide a more accurate measure of these variables.

A caveat should be added that analyses did not show that *all* textisms, but only a subset which varied across analyses, were related to writing ability. This is most likely due to the limited samples of those participants with no college or a college degree compared with those having some college education. Furthermore, in the group with no college education, the participants were not asked if they planned to go to college. However, the fact that 82%

of this group was 19 years old or older, which may validate that they did not go to college directly from high school. In the group with some college education, no attempt was made to determine where the participants were in their education. Exact level in college may have influenced the results.

In addition, age was assessed differently in the two studies. In Study 1, participants were asked to choose the age range that pertained to them, so participants' exact ages were not known. In Study 2, participants provided their birth year so that their exact ages were known. Participants in the three educational groups did differ significantly in age with those with more education being older. Although no age analyses could be done with the formal writing in Study 1, adding age as a correlate of both formal and informal analyses did not change the significant differences found for each educational group in Study 2. This lends further credence to the results comparing educational groups.

Conclusion

The present study investigated the relationship between reported texting behavior and writing skill in young adults aged 18 to 25 years old. As was found in earlier studies, there are significant associations between reported texting behavior and literacy skills. However, in contrast with previous research, the data from the current study found negative associations between reported use of textisms in everyday electronic communication and writing skill, particularly for formal writing. On the contrary, the reported daily use of textisms was, by and large, related to better informal writing. The negative associations between texting and literacy also appear to moderate to some degree by gender and by level of education in young adults. A thorough understanding of the impact of texting upon literacy probably will require consideration of the component skills involved in SMS use and language skills, as well as the functions for which both are used.

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Notes

1. Study 1 formal, $r(333) = .93, p < .001; r^2 = .86$; Study 2 formal, $r(381) = .92, p < .001; r^2 = .85$; and Study 2 informal, $r(381) = .93, p < .001; r^2 = .86$.
2. Some college education $M = 2.27; SD = 1.39$; no college education $M = 1.87; SD = 1.29$; college degree $M = 2.12; SD = 1.37; F(2, 706) = 3.68, p = .013; \eta_p^2 = .01$.
3. Some college $M = 3.53; SD = 1.42$; college degree $M = 3.39; SD = 1.48$; no college education $M = 3.01; SD = 1.50; F(2, 706) = 5.43, p = .003; \eta_p^2 = .015$.
4. Some college $M = 12.40; SD = 4.36$; college degree $M = 11.88; SD = 4.57$; no college education $M = 11.02; SD = 4.39; F(2, 706) = 3.32, p = .011$.

5. No college $M = 4.03$; $SD = 2.87$; college degree $M = 3.15$; $SD = 2.00$; some college; $M = 3.19$; $SD = 2.21$; $F(2, 708) = 6.05$, $p = .002$; $\eta_p^2 = .017$.

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