Text-message abbreviations and language skills in high school and university students

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Abstract

This study investigated the use of text message abbreviations (textisms) in Australian adolescents and young adults, and relations between textism use and literacy abilities. Fifty-two high school students aged 13-15 years, and 53 undergraduates aged 18-24 years, all users of predictive texting, translated conventional English sentences into textese using two methods; writing messages down, and typing them into mobile phones. Participants produced a variety of textisms, and in both translation methods, adolescents and young adults used textisms in nearly identical ways. This was true for the proportion and types of textisms used, textism categories produced, and consistency with which textisms were spelled. The use of textisms was negatively correlated with scores for reading, nonword reading, spelling and morphological awareness, but some of these relationships were accounted for by participants’ usual text-messaging frequency. For these age groups, concerns that frequent texting may mask or even contribute to poor linguistic skills cannot be dismissed.
Text-message abbreviations and literacy skills in high school and university students

In the past decade, mobile phones have become a ubiquitous means of communicating with others. Text messaging, or texting, whereby individuals use a mobile phone keypad to send messages through text rather than voice, is particularly popular among adolescents and young adults worldwide (e.g., Drouin & Davis, 2009; Ling, 2004), although females tend to send more numerous, lengthy and complex text messages than males (Ling, 2004; Rosen, Chang, Erwin, Carrier, & Cheever, 2010). In many countries, including Australia, there is currently more than one mobile phone for every person (Australia Telecommunications Report, 2009). A 2004 survey reported that 83% of Australian adolescents owned a mobile phone, and sent an average of one to five text messages per day (Australian Psychological Society, 2004). More recent surveys suggest that young adult Australians spend about half an hour a day reading and writing text messages (James, 2007), and that text-messaging is used by about 90% of high school students (Australian Bureau of Statistics, 2008).

Until recently, text messages were limited to 160 characters (most current phones automatically concatenate 160-character sections into single, longer messages), giving rise to an abbreviated form of written language known as textese, which has features in common with the language used in online written computer-mediated communication, or Instant Messaging (IM) (Ling & Baron, 2007). Textese is distinctive in its use of textisms; contractions and nonstandard spellings specifically developed to reduce the length of words for fast and cost-effective text messaging (Crystal, 2008). Researchers have categorised textisms as logograms (e.g., c for see or 2 for to), letter/number homophones (e.g., m8 for mate) and emoticons (e.g., :-) for happy), among others (e.g., Crystal, 2008; Plester, Wood, & Joshi, 2009; Thurlow & Brown, 2003). Partly because text messaging is a relatively recent phenomenon, there is limited empirical research on the relationship between texting
behaviours and conventional language skills, and the evidence that does exist comes largely from children aged 9-12 years and from young adults. There seems to be little research examining how the use of textese in younger teenagers (13-15 years) may relate to more traditional measures of written and spoken language skill. The current study includes students of this age group, as well as of university age. We aimed to address three apparent gaps in the texting literature, by examining a) the effect of data collection method on texting behaviour, b) the effect of text entry method on texting behaviour, and c) the consistency with which people spell the textisms they use.

Data Collection Method

An important aim of this study was to investigate possible differences in text-message data collection methods. Restrictions on mobile phone use in many schools mean that it can be difficult to collect naturalistic data from school-age participants. Some researchers (e.g., Plester, Wood, & Bell, 2008; Plester et al., 2009) have responded to these restrictions by having children write down their text message translations on paper, rather than type messages into a phone. However, collecting data in this way raises questions about accuracy and ecological validity. We therefore asked our participants to translate sentences from standard English to text-style messages by writing them down, and also by typing them into their mobile phones, and we compared the characteristics of each.

Text Entry Method

Unlike conventional English, textese has no consistent established spelling system. It seems likely that standard patterns will emerge over time, and some textisms are already widely used and recognised, for example 4 for for and b for be (e.g., Crystal, 2008; Drouin & Davis, 2009). However, many textisms have several plausible abbreviations, and are written in various ways (e.g., because may be shortened to cause, coz, cus, becos, bcoz, bcus, bcs, bc, Kemp, 2010; got to go shortened to gotta go, got 2 go, g2g, Varnhagen et al., 2009). It is
unclear how individuals choose between the alternatives. The method of texting used may influence the textisms produced. Alphanumeric mobile phone keypads contain twelve keys, with each key representing a number and 3-4 other characters (e.g., 2, a, b, c). Words may be entered by pressing each key several times until the required letter is displayed (the *multi-press* method), or by changing to *predictive* mode, where each key is pressed once, and the phone uses a dictionary to predict the most likely word resulting from a particular combination of key presses (Taylor & Vincent, 2005). In studies with children, predictive texting has been used by only a minority of participants (Plester et al., 2008, 2009) although there is some evidence that it is becoming the more popular method for young adults (Kemp, 2010; Ling, 2004). Any textism, whether common or creative, must be programmed into a phone’s dictionary for the phone to provide that textism as an option. Using the predictive entry method may thus reduce the number of creative textisms used, and leave intact the use of less creative textisms, including the omission of punctuation and grammatical features such as capital letters and apostrophes, since extra key presses are required to include these in at least some entry systems. This study is, to our knowledge, the first to focus specifically on predictive texting.

**Textism Spelling Consistency**

The current study also examined how consistently the participants used the same textism for a single word each time they wrote that word. Research in conventional orthography has shown that poorer spellers’ errors are often less consistent than those of better spellers (e.g., Dietrich & Brady, 2001). Repeated exposure to written words is thought to build up orthographic representations in memory (Holmes & Carruthers, 1998), and thus more frequent text-messaging might predict more consistent spelling of textisms. However, in addition to mere exposure, individual differences may also play a role in the strength of orthographic representations, as some good readers are also poor spellers (Frith, 1980). Thus,
general spelling skill may also predict textism consistency. However, the deliberate nature of textism creation (compared with the presumed accident of spelling errors) makes these hypotheses tentative. Indeed, if texting represents creativity and play with language (Crystal, 2008), better spellers might make the most of this chance to create a variety of textisms, even if it requires overriding suggestions from the predictive-text dictionary. Individuals, especially in adolescence, may also use textisms for broader social reasons, such as to signal social identity or group membership, (e.g., Green, 2003; Lewis & Fabos, 2005).

**Links between Textism Use and Literacy Skills**

Media attention has focused on concerns that forms of casual, immediate communication such as text messaging and IM may threaten traditional standards of grammar, spelling and written expression (Crystal, 2008; Tagliamonte & Denis, 2008; Thurlow, 2006). Despite concerns that textisms may begin to intrude into conventional writing (e.g., Massengill Shaw, Carlson, & Waxman, 2007), recent research has shown that both undergraduates (Drouin & Davis, 2009) and children (Plester & Wood, 2009) perceive the use of textese to be inappropriate in academic writing. An online study by Rosen et al. (2010) reported that textisms did intrude into young adults’ formal and informal writing in experimenter-elicited writing samples, but only rarely (2-3 times each in only 20% of samples). In contrast to the ideas portrayed by the media, textese can be regarded as a creative use of language which offers an authentic representation of speech (Tagliamonte & Denis, 2008; Thurlow & Brown, 2003). Further evidence is needed on the relationships between conventional language practices and how textisms are used.

Reading and spelling in English depend to a great extent on the ability to decode letters (graphemes) into sounds (phonemes) and vice versa. However, the English spelling system has regularities beyond the phoneme-grapheme level. Morphological awareness is required to understand that words with similar-sounding endings require different spellings according to
their structure (e.g., the final /t/ sound of *kissed* requires *-ed* because it is a regular past-tense verb; the final /t/ sound of *coast* does not). Orthographic awareness helps spellers learn that certain letter patterns are appropriate in some word contexts but others are not (e.g., word-final /tʃ/ is generally spelled *ch* after two vowel letters, as in *peach*, and *tch* after one, as in *pitch*, Hayes, Treiman, & Kessler, 2006).

These different types of metalinguistic awareness may also be important for creating and deciphering textisms. Some categories of textism emphasise words’ sound structure, often at the expense of spelling conventions, including non-standard spellings (e.g., *fone* for *phone*, *wot* for *what*) and letter/number homophones (e.g., *2day* for *today*, *l8* for *late*). Readers and writers of such textisms must be able to encode and decode these phonological strings while ignoring aspects of their conventional spelling. Previous evidence is scant, but the related skill of phonological awareness was shown to correlate with 10- to 12-year-old children’s use of textisms in elicited messages (Plester et al., 2009) but not with university students’ textism use or understanding (Kemp, 2010). Similarly, morphological awareness may be helpful for writing and reading other categories of textism. For example, knowing the morphological structure of a frequently abbreviated word such as *coming* (*comin*) or *anyone* (*any1*) might make it easier to create or decipher similar abbreviations for words with similar morphological structure (e.g., *goin*, *some1* for *going*, *someone*). Finally, many textisms break orthographic rules by omitting letters (e.g., *txt* for *text*, *tgher* for *together*) or by combining numbers and letters (e.g., *2morrow* for *tomorrow*, *4get* for *forget*). It is unclear whether having a good knowledge of orthographic conventions would make it more or less difficult to read or write such textisms. Thus, the current study includes measures of phonological decoding, and morphological and orthographic awareness, as well as of reading and spelling.

To date, only a small number of empirical studies have investigated relationships between traditional language and literacy skills and text messaging behaviour, and the results have
varied with the age group studied. Plester et al. (2009) report frequent text messaging to be positively associated with reading and spelling measures in British children aged 10 to 12 years. However, no similar significant relationship has been observed between the frequency of text messaging and literacy scores in Australian (Kemp, 2010) or American university students (Massengill Shaw et al., 2007). In 10- to 12-year-old British children, the use of textisms has been shown to correlate positively with verbal reasoning and spelling (Plester et al., 2008), even after controlling for the number of text messages sent per day, and with reading, phonological awareness and vocabulary (Plester et al., 2009). Plester et al. (2009) also showed that textism use predicted a small but significant amount of variance in reading skill even after controls for age, short-term memory, vocabulary, phonological awareness, and years of phone ownership. Studies with adults show contrasting results. After controlling for frequency of message-sending, there were no significant correlations between textism use and reading, writing, morphological or phonological awareness scores in Australian undergraduates (Kemp, 2010), whereas negative associations between reported textism use and formal writing skill were observed in young American adults of 18-25 years (Rosen et al., 2010). These mixed results suggest that relationships between textism use and conventional literacy skills may be different for young adults than for children.

The aim of this study was thus to investigate textism use among high school and university students. Specifically, we examined the proportion of textisms, the number of textism categories produced and the consistency with which textisms were spelled, and whether any of these differed between written and texted messages. We also explored the nature of the relationships between textism measures and conventional literacy scores, and the differences, if any, between written and typed text messages.

It was predicted that high school and university participants would not differ significantly in terms of the proportion of textisms produced or number of categories used, on the basis of
Tagliamonte & Denis’ (2008) evidence that teenagers and young adults use written language in similar ways in IM. Robust sex differences reported in the literature (e.g., Ling, 2004; Rosen et al., 2010) led us to hypothesise that females in the present study would produce more textisms, and more textism categories, than males. The comparison of textism data collected by participants handwriting messages versus typing messages into their phones was included to clarify the interpretation of previous findings and the design of future experiments, and we made no hypotheses about potential differences.

Previous research with children (Plester et al., 2008; 2009) has shown that textism use and creativity predict linguistic skills, even after controlling for texting experience and other skills, although the scant evidence on textism use and literacy in young adults suggests neutral (Kemp, 2010) or even negative relationships (Rosen et al., 2010). We predicted that after controlling for age and texting experience, textism use would predict a small but potentially significant amount of variance in scores of reading, spelling, and phonological decoding, and possibly also morphological and orthographic awareness.

Method

Participants

Fifty-three first-year psychology students from an Australian university chose to participate in this research project, advertised as a ‘texting study’, for course credit. There were 15 males and 38 females, with a mean age of 20 years ($SD = 1.8$, range 18-24 years). Sixty-two Grade 8 and 9 students (from three state high schools in the same region), with parental permission, responded to an invitation to participate sent via their schools. Data from 10 school students were excluded from the final analyses because they failed to complete all of the tasks ($n = 4$), or because another student attempted to send translations of the test messages to their phone during testing ($n = 6$). This left 52 high school participants: 32 males
and 20 females, with a mean age of 14 (SD = 0.7, range 13-15 years). All participants owned a mobile phone, were familiar with text messaging and spoke English as their first language.

**Materials**

**Messages.** The texting task comprised two lists of five messages in Standard English (see appendix), concerning social and education-related events. Each list contained 193 words, with the number of characters per message ranging from 208-284. To increase the scope for the use of textisms, the messages contained numerous words which had been abbreviated by undergraduates at the same university in a study by Kemp (2010). Twenty-three target words which had been abbreviated in several ways in Kemp’s study were repeated within and between the two lists to allow scoring for consistency (see appendix). An example message is

*I forgot to call Kate tonight because I was studying. I hate exams,* which might be written in textese as *i 4got 2 call k8 2nite bcs i woz studyin. i h8 xamz,* or *i 4got 2 call kate 2night bcoz i was studyN. I hate examz,* or as any similar combination.

**Questionnaire data.** We collected basic demographic information and information regarding mobile phone and texting use via a two-page questionnaire.

**Literacy skills.** We measured traditional literacy and language skills with the spelling and reading subtests of the Wide Range Achievement Test, fourth edition (WRAT-4) (Wilkinson & Robertson, 2006), and phonological decoding with the Nonword Reading Test (Martin & Pratt, 2001). We employed two experimental tasks to measure morphological and orthographic awareness. The morphological awareness task (Kemp, 2010) consisted of 12 triplets of words, and within each triplet all the words had the same ending sound/s (e.g., *baker, lover, cover: see appendix). Two of the words had morphological endings which changed the meaning of the word (e.g., the -er ending of *baker and lover*). The third word happened to share the same ending, but with no morphological basis (e.g., *cover*). A correct response required participants to distinguish between words which constitute a single
morpheme (e.g., *cover*) and words which have a base + ending structure (e.g., *bake + er*).

The test of orthographic awareness consisted of 24 nonword pairs, each with two different spellings (e.g., *keach* vs. *keatch*). Both spellings would result in the same pronunciation, but only one (*keach*) adhered to English orthographic conventions, as described in the introduction. To increase the scope for potential variation in scores, the word pairs we chose were the 24 items which adult participants had found the most difficult in Hayes et al.’s (2006) study (see appendix).

**Procedure**

Testing was conducted with groups of 5-18 participants, in school/university classrooms. Participants attended two testing sessions a week apart, each lasting between 45 and 120 minutes. We provided task instructions at the beginning of the session, after which participants worked through the tasks at their own pace.

**Session 1.** All participants completed the text messaging questionnaire. Then, in the texting task, participants translated the (printed) sentences in both lists of messages from Standard English into the spelling that they would use “if sending the message to a friend”, typing one list into their own mobile phones, and writing the other list down on paper. List order was counterbalanced across participants. Participants all had phones with alphanumeric (not qwerty) keypads, and were asked to use the input mode that they usually employed: predictive or multi-press. Ethical concerns regarding costs and the privacy of participants’ phone numbers meant that participants did not send their typed messages, but once they had finished typing, transcribed all typed messages onto paper as they appeared on their phone screen. The experimenters checked each transcription for accuracy and made corrections where necessary. The translations of the two lists were alternated with the completion of the orthographic and morphological awareness tasks.
Session 2. First, we administered the spelling subtest of the WRAT-4 to groups. This standardised test requires participants to spell dictated real words of increasing difficulty. Participants then repeated the texting task, writing the list that they had previous texted, and texting the list that they had previously written. During this session, each participant was taken into a separate room to complete the two reading tasks; the WRAT-4 reading subtest and the Nonword Reading Test. Both are standardised tests in which participants read aloud from a list of increasingly difficult words and nonwords, respectively.

Results

Questionnaire Data

We examined questionnaire responses to compare the experience and use of text messaging in high school and university students. In both groups, most participants reported that when writing text messages they used abbreviated spellings “for some words, such as u for you” (high school 46%, university 51%) or not at all (high school 37%, university 43%). Only a minority reported using textisms “for most words” (high school 17%, university 6%).

Undergraduates reported having significantly more years of text messaging experience ($M = 5.29, SD = 1.85$) than high school students ($M = 2.92, SD = 1.74$), $t (103) = 6.75, p < .001$, Cohen’s $d = 1.32$, but high school students were significantly younger ($M = 11.40$ years, $SD = 1.71$) than university students ($M = 14.34$ years, $SD = 1.91$) when they first received a mobile phone, $t (103) = 8.29, p < .001$, Cohen’s $d = 1.63$. High school students reported sending more text messages per day ($M = 34.82, SD = 43.29$) than university students ($M = 18.00, SD = 19.76$), and males reported sending the same number of messages per day ($M = 28.26, SD = 35.12$) as females ($M = 28.22, SD = 36.63$). The message-frequency data were positively skewed, and Mann-Whitney U tests revealed no significant differences between high school and university students ($U = 737.0, p = .157$, two-tailed), nor between males and females ($U = 853.5, p = .847$, two-tailed).
Participants at both education levels predominantly used predictive text messaging; about 79% of high school students and 86% of university students. The rest used the multi-press entry method. As planned, we conducted further analyses using data only from the 87 predictive texters. This meant excluding the relatively small number of high school \((n = 11)\) and university \((n = 7)\) students who reported using multi-press texting.

**Textism Use across Education Level, Sex, and Data Collection Method**

We converted the number of textisms used by each participant to a proportion of the total number of words produced. Table 1 presents means and standard deviations of textism proportions for both education levels, sexes, and data collection methods.

**Table 1**

As shown in Table 1, textism use was generally quite low, with remarkably similar patterns across education level and sex groups, and even across written and texted messages. We conducted a repeated-measures ANOVA with the proportion of textisms as the dependent variable, with data collection method (written, texted) as the repeated measure and with education level (high school, university) and sex (male, female) as the between-subjects factors. There were no significant main effects, and no significant interactions, confirming that teenagers and young adults of both sexes used textisms with near-identical frequency, whether they typed messages into a phone or wrote them down.

**Message length**

The full versions of the messages were of varying length, and Table 2 shows the extent to which the participants reduced the length of the messages in translation, written and texted.

**Table 2**

As shown in Table 2, the mean character counts of the translated messages were reduced to 91-96% of their full versions (with Message 5 of List A reduced to about 80%, probably because it contained relatively more words which could be reduced to a single character, such
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as see and for). The character counts for the translated texted and written versions were virtually identical, and all were longer than the maximum single-message length of 160 characters.

**Textism Spelling Consistency**

We examined the consistency of participants’ spelling of textisms for our target words (e.g., tomorrow, because, weekend; see appendix). First, we calculated an individual spelling score for each target word for every participant, by counting the number of times each different spelling (including conventional spelling) was used. For example, the word together, presented eight times, was spelled by one participant five times as 2gether, twice as 2gether, and once as 2ghr. We obtained consistency scores by summing the squares of the individual spelling scores, divided by the total number of times the word was produced (in the example, \((5/8)^2 + (2/8)^2 + (1/8)^2 = 0.47\)). A consistency score of 1 indicated that the same spelling was used every time that word was written. If a participant spelled a target word conventionally every time, no consistency score was recorded for that word, for that person. As shown in Table 1, the overall level of spelling consistency for textisms was about 72%.

We conducted a repeated-measures ANOVA, with consistency score as the dependent variable, data collection method (written, texted) as the repeated measure and education level (high school, university) and sex (male, female) as the between-subjects factors. Females were more consistent than males, \(F(1, 70) = 4.27, p = .04\), partial \(\eta^2 = .06\), but no significant differences were found between education levels or data collection methods.

**Textism Categories**

We categorised the textisms produced by participants using a classification system adapted from Plester et al. (2009) and Crystal (2008). Table 3 summarises the twelve categories used.

**Table 3**
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Number of categories used. Once all textisms were coded, we counted the number of categories (out of 12) that each participant had used, for both written and typed text messages, as shown in Table 4.

**Table 4**

Density of categories. As well as the number of categories used, we were interested in the density of categories. Where applicable, we classified textisms as representing more than one category, in keeping with previous coding methods (e.g., Varnhagen et al., 2009). For example, the textism 2moz (for tomorrow) represents a combined letter/number homophone (2 + word), but also contains an accent stylisation (moz for morrow). Similarly, the textism ive (for I’ve) omits both the apostrophe and capitalisation. We divided the total number of categories by the total number of textisms produced to obtain a score which reflected the density of categories. Table 4 also displays the density of categories for each education level, sex and data collection method.

A repeated-measures ANOVA with entry method as the within-subjects factor and education and sex as between-subjects factors showed no significant differences between university and high school participants, or between males and females, in terms of number of categories employed. However, overall, participants used significantly more categories when they wrote messages down than when they typed them into their phones, $F(1, 82) = 8.65, p < .01$, partial $\eta^2 = .10$. This suggests that although different methods of data collection yield remarkably similar results, some differences exist, at least for this feature of message categorisation. A similar repeated-measures ANOVA for density of categories revealed that this density was significantly higher for written than for texted messages, $F(1, 81) = 6.98, p = .01$, partial $\eta^2 = .08$, with no significant differences for sex or education level. Thus, although the written and texted messages were remarkably similar overall, the written
messages did include a wider range of textism categories, and a higher proportion of categories than texted messages.

**Types of categories used.** To investigate whether individual categories were used in different ways according to education level or data collection method, we divided each individual category score by the total number of categories used. Differences between data collection methods were significant for only two types of textism: contractions (written, $M = 0.12, SD = 0.09$; texted, $M = 0.07, SD = 0.08$; $t(85) = -5.14, p < .001$, Cohen’s $d = 1.12$) and accent stylisations (written, $M = 0.13, SD = 0.17$; texted, $M = 0.09, SD = 0.11$; $t(85) = -3.30, p = .001$, Cohen’s $d = 0.72$), which were both produced more frequently when participants wrote, rather than texted, the messages. In terms of education level, initialisms were used significantly more by undergraduates ($M = .04, SD = .06$) than high school students ($M = .004, SD = .009$), $t(84) = 4.27, p < .001$, Cohen’s $d = 0.93$. No other differences were significant, meaning that overall patterns of category use were very similar for both education levels. Because there were so few differences according to education level or data collection method, Figure 1 displays the mean proportions of each of the twelve categories for all participants, collapsed across the two methods of data collection.

**Figure 1**

In interpreting the figure, it should be borne in mind that the wording of the messages that the participants were asked to translate at least partially constrained the opportunities for using each textism category. For example, although participants could potentially shorten, contract, or misspell as many words as they liked, the opportunity for omitting capitals or apostrophes, or clipping the $g$ from -$ing$ endings was limited by the messages’ wording. With these constraints in mind, it can be seen from the figure that the most common textisms were omitted capital letters and omitted apostrophes, which made up .24 and .17 of categories respectively. Accent stylisations, contractions, single letter/number homophones and
shortenings comprised .09 to .11 of categories, while non-standard spellings, combined letter/number homophones, symbols and spelling errors made up .04 to .06 of categories. It should be noted that if single and combined letter/number homophones are grouped together, as in some previous research (Plester et al., 2008, 2009), the textism categories used would more closely resemble the patterns reported previously. Participants used initialisms and g-clippings the least, with these each comprising less than .03 of categories produced.

**Literacy Scores**

Table 5 shows the university and high school students’ mean standard scores on the tests of spelling, reading and nonword reading, which were in the average range, and also their scores on the experimental tests of morphological and orthographic awareness. The reliability of these tests (Cronbach’s alpha) was .69 and .66, respectively.

***Table 5***

Independent-samples *t*-tests revealed no significant differences between the groups on WRAT spelling or nonword reading, but unexpectedly, the high school students significantly outperformed the undergraduates on WRAT reading, *t* (84) = -4.03, *p* < .001, Cohen’s *d* = 0.88. For the experimental tasks of morphological and orthographic awareness, one-sample *t*-tests revealed that mean scores were significantly above chance levels; *t* (85) = 7.43, *p* < .001, Cohen’s *d* = 1.61 and *t* (85) = 16.88, *p* < .001, Cohen’s *d* = 3.66, respectively, although it is clear that the morphological task was the more difficult. Independent samples *t*-tests revealed that undergraduates scored significantly higher than high school students on morphological awareness, *t* (84) = 2.17, *p* = .03 Cohen’s *d* = 0.47.

**Correlational Analyses**

Table 6 shows the results of bivariate correlations between measures of texting experience and behaviour, and literacy scores. The two age groups had shown such similar behaviour on all of the texting tasks that we decided to combine them for the final analyses, even though
they had differed significantly on two of the five literacy measures (reading and morphological awareness). This also kept the sample size as large as possible. These bivariate correlations were calculated only for the texted messages, not the written ones, and are shown in the lower/left part of Table 6.

**Table 6**

Table 6 shows that, in contrast to previous research with children, the correlations between textism use and literacy scores were largely negative. Sending more messages per day, using a greater number of textism categories, and using a greater proportion of textisms were all moderately to weakly associated with lower scores on spelling, reading, nonword reading and morphological awareness, although this may reflect the unexpectedly worse reading performance by the university than the high school students. A longer period of texting experience was moderately associated with lower scores on word and nonword reading. None of the texting experience or literacy scores correlated significantly with textism consistency.

It is possible that some of the negative relationships between texting and literacy measures could be attributed in part to the frequency with which participants usually sent text messages, and thus with their usual exposure to texting and textisms. Finally, then, we conducted partial correlations between the texting and literacy measures, controlling for number of messages sent per day. These correlations are shown in the upper/right part of Table 6. After this control, the negative correlations between the proportion of textisms used and real-word reading and spelling no longer reached significance, but remained significant for nonword reading. Number of textism categories used still correlated significantly and negatively with real- and nonword reading and spelling, and textism spelling consistency remained non-significantly correlated with any of the literacy measures.

**Discussion**
The aim of this study was to investigate and compare the use of textisms in high school students of 13-15 years and university students of 18-24 years. In both handwritten and typed messages, we examined the proportion of textisms produced, textism spelling consistency, and the number and types of textism categories employed, as well as relationships between conventional literacy skills and texting behaviour.

The majority of our participants used the predictive text entry method; 79% of high school students, and 86% of university students. This is greater than the prevalence reported in previous research; 20% (Plester et al., 2008) to 55% (Plester et al., 2009) of 10- to 12-year-old British children, 55% of British undergraduates (Thurlow & Brown, 2003), and 77% of Australian undergraduates (Kemp, 2010). Rapid changes in technology mean that texting behaviour is constantly evolving, and research will need to keep pace with such changes. The translation of the given sentences into text-messages resulted in an average reduction of sentence character count from about 233 to about 214, a reduction of about 8%. This 214-character average is still much longer than the 160-character maximum single-message length, presumably because the full versions were simply too long to reduce further.

By rapidly suggesting possible words, the predictive method should greatly reduce, or even eliminate, the need for textisms. Often the whole word is suggested after only a few letters are typed in, meaning that typing in abbreviated spellings is often no faster than simply typing in the first few letters and then choosing the appropriate entire word’s spelling. However, about half the sample reported using textisms for at least some words, and textisms still accounted for 13-16% of words in the text messages translated by participants. This is substantially lower than the 50-54% shown by British children in translated messages (Plester et al., 2008, although their messages were more realistic in their shorter length), although more naturalistic elicited messages in that population produced about 35% textisms (Plester et al., 2009). However, the present proportion is similar to the nearly 19% textisms produced
in natural text messages by British undergraduates (Thurlow & Brown, 2003), and rather higher than the 5% in those of American undergraduates (Ling & Baron, 2007). Regardless of text entry method, the use of textisms clearly differs with age group and message type, but does seem generally lower in young adults than in children. However, the present study showed no significant differences between teenagers and young adults in terms of the proportion of textisms used. This is consistent with findings that adolescents and young adults use similar rates of short forms in IM (Baron, 2004), and that individuals may leave behind the desire to produce extensive textisms in early adolescence (Tagliamonte & Denis, 2008). However, the social meaning and ‘impression management’ associated with continued use of textisms may vary with age (e.g., Green, 2003; Lewis & Fabos, 2005).

In general, we observed virtually identical texting behaviours between high school and university students on our other measures as well. The two groups showed very similar use of the 12 textism categories examined, except for initialisms, which were used more often by undergraduates than by high school students. As noted earlier, the wording of the messages themselves at least partially restricted the opportunities for use of certain categories: for example, contraction is potentially possible with most words, but g-clipping can only be done when there are -ing endings to clip. With these restrictions in mind, the most frequent categories for both groups were omitted capitals (i want) and omitted apostrophes (I cant), followed by accent stylisations (tomoz), contractions (tmrw), single letter/number homophones (u), and shortenings (xcellent). Plester and colleagues’ sample of British children’s most frequent categories were combined letter/number homophones (l8r) and non-standard spellings (nite) (Plester et al., 2008), and combined letter/number homophones, contractions (txt) and accent stylisations (hafta) (Plester et al., 2009). Our sample’s use of predictive texting may have reduced the use of more creative textisms in comparison to textisms of omission (of capitals and of apostrophes). This is because predictive texting
predicts only common abbreviations, or those that the phone user has programmed in. Thus, someone using predictive texting is unlikely to come up with new textisms each time, but instead to use the existing suggestions. In contrast, many phones allow the incorrect omission of capitals and apostrophes, and so users can save time by not trying to include these features.

It was expected that predictive texting may have also have discouraged any variability in the spelling of textisms, but spelling consistency was only 68 to 78%. If an individual is using predictive spelling and types a spelling that is not in the phone’s dictionary, such as *cos* *(because)*, the predictive function “remembers” that spelling and will provide it as an alternative the next time those keys are pressed in the same sequence. Textism spelling consistency thus depends partly on the ability (or decision) to learn and remember one’s own previous spellings, and thus we expected that there might be significant correlations between textism consistency and texting frequency, and/or spelling ability. However, none of these relationships was significant. Perhaps because no established system of textism spelling exists, participants may not have found it important to write their textisms the same way every time. Alternatively, texters might vary their spelling for different reasons: poorer spellers because they cannot remember the exact version they used last time, and better spellers because they are having fun with language, or tailoring their textisms to suit the message recipient. Further, texters of any ability may vary the textism they use for a word according to the length of the message or the time available to write it. Overall, the current results suggest that the use of predictive texting does not standardise all aspects of textism spelling, and variability continues to exist both between and within texters, regardless of texting experience or literacy skill.

Previous researchers (Plester et al., 2008, 2009) have collected textism data by having (child) participants handwrite messages as they imagine they would type the them, but the ecological validity of this method is not clear. In the present study we had participants type
and handwrite the same messages, and found that in both conditions, the use of textisms was remarkably similar. No significant differences were found between texted and written data in terms of the proportion of textisms to total words produced, nor in terms of consistency scores. This suggests that as early as age 13 years, individuals can reflect upon their own texting habits and reproduce textisms on paper in a representative way, without the confines imposed by a mobile phone keypad. There were a few differences; participants used more textism categories overall, and more categories per textism, when writing messages down than when typing them. Specifically, participants used more accent stylisations and contractions when they wrote messages down. Given that ethical and practical requirements often restrict the use of mobile phones in school settings, future research may benefit from these findings. While the use of written data could be justified in conducting a study which focused on the proportion and/or consistency of textisms used, the use of texted data would be more appropriate for a fine-grained analysis.

In terms of sex differences, we did not observe the predicted greater use by females of textisms and of textism categories that has been reported in previous research (e.g., Ling, 2004; Plester et al., 2009; Rosen et al., 2010). The text messages dictated here were rather long, and involved mainly social information (e.g., Kate didn’t lose weight and is still worrying), two features which are normally more associated with messages written by females than males (Baron, 2004). The nature of these messages might thus have restricted the scope of the sex differences that would occur in naturalistic messages.

The final important aim of the current study was to investigate the links between various aspects of texting behaviour, and measures of literacy and language skill, in high school students and undergraduates. The initial correlations revealed an overwhelmingly negative picture: the number of text messages sent per day, proportion of textisms produced, and number of textism categories used all correlated negatively with the standardised measures of
reading, spelling, and nonword reading, and the experimental measure of morphological awareness. (Correlations with the experimental measure of orthographic awareness were not significant.) These results differ from those observed previously in 10- to 12-year-old children, who have generally shown positive associations between literacy skills and use of text messaging and of textisms (Plester et al., 2008, 2009). They also differ from research with university students, which has revealed no significant differences on language measures according to frequency of texting (Massengill Shaw et al., 2007) or use of textisms after controlling for text-messaging frequency (Kemp, 2010).

When partial correlations were calculated controlling for number of text messages sent per day, the proportion of textisms correlated significantly and negatively with nonword reading (but no longer real word reading and spelling), and number of categories still correlated significantly and negatively with real- and nonword reading and spelling. It seems that some of the negative relationships observed between textism use and conventional literacy skills might be accounted for, at least in part, by texting frequency rather than the use of textisms themselves. However, the negative relationships are still unexpected, given previous results.

Of course, it cannot be inferred that greater use of text messaging is the cause of poorer attainment on literacy and language measures. Teenagers and young adults with lower linguistic abilities may be motivated to text more frequently by the greater freedom and flexibility provided by this non-conventional form of written language (Plester et al., 2009). Alternatively, young people who are less competent in literacy may use texting to mask poor spelling skills. However, neither of these explanations can be the whole story, as the use of textisms, and of textism categories, did not individually contribute significantly to language outcomes, although their combined contributions reached significance for reading, nonword reading, and spelling. It must also be noted that the individuals tested here all used mainly predictive texting, not the multi-press entry method used most often by participants in
previous studies. Thus, the types of textisms that the current participants were regularly using might have been less creative than those experienced by previous samples, as is suggested here by the relatively high numbers of textisms of omission (omitted apostrophes and capitals) compared to, for example, the letter-number homophones more common in previous studies (e.g., Plester et al., 2008, 2009). Future research should investigate potential differences with texting input method, especially with advancing technology.

There are some limitations in how well the current findings can be generalised to the real world of text-messaging. Estimates of the average number of words in naturalistic messages vary widely, from 7.7 words in samples from American undergraduates (Ling & Baron, 2007) to 14 words in British undergraduates (Thurlow & Brown, 2003), to 22 words in British children (Wood, Plester, & Bowyer, 2008, as cited in Plester & Wood, 2009). The text messages designed for this experimental study were very long in comparison, averaging about 40 words per message. As previously noted, the proportion of textisms used per message also differs substantially according to participants’ age and familiarity with texting, as well as with the nature of the message (translated, elicited, or naturalistic). It is not clear how well the current participants’ use of textisms represented their everyday use, but the 13-16% observed seems to fit with previous reports. It is also difficult to know how well participants’ reported frequency of text-messaging, and use of textisms, reflected their actual behaviour. Future research might aim to analyse naturalistic messages collected from individuals’ phones, as some researchers have successfully done (e.g., Ling, 2004; Ling & Baron, 2007; Plester, Wood, Jackson, & Wilde, 2009), rather than using translation or dictation exercises.

In conclusion, this study has shown that the moderate use of a variety of textisms remains an important part of writing text-messages, even with the predictive entry method, for both adolescent and young adult texters. In contrast to the largely positive associations observed in
children, in this sample we saw significant negative correlations between texting behaviours and more traditional literacy and language skills, although some of these seem to be accounted for by frequency of text-messaging overall, rather than any specific use of textisms. Further research will be required to examine the causes behind these correlations. If less competent language users are drawn to the creativity and flexibility of textese in a way that improves their language skills through exposure to written language (as has been suggested with younger children), then mobile phones could prove useful in educational settings. However, if negative relationships indicate that frequent texting somehow interferes with the development of language and literacy skills, or provides an opportunity for less able students to mask poor spelling, quite different conclusions may be drawn. Texting and other forms of computer-mediated communication are becoming increasingly prevalent at increasingly younger ages, and further research will be necessary to clarify the interactions between conventional language and literacy skills and the frequent use of written abbreviations in digital communication.
Table 1

*Means and Standard Deviations for Proportion of Textisms and Consistency Scores for Education Level, Sex and Data Collection Methods*

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Prop. of textisms to total words</th>
<th>Consistency scores for target words</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Texted</td>
<td>Written</td>
</tr>
<tr>
<td>High school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n = 22)</td>
<td>.16 (.11)</td>
<td>.16 (.11)</td>
</tr>
<tr>
<td>Female (n = 18)</td>
<td>.16 (.16)</td>
<td>.15 (.15)</td>
</tr>
<tr>
<td>Total (n = 40)</td>
<td>.16 (.14)</td>
<td>.15 (.13)</td>
</tr>
<tr>
<td>University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n = 14)</td>
<td>.13 (.16)</td>
<td>.13 (.15)</td>
</tr>
<tr>
<td>Female (n = 32)</td>
<td>.14 (.14)</td>
<td>.14 (.14)</td>
</tr>
<tr>
<td>Total (n = 46)</td>
<td>.14 (.14)</td>
<td>.14 (.14)</td>
</tr>
</tbody>
</table>
Table 2

*Character Counts for Full Messages and Mean Character Counts for Participants’ Texted and Written Translations, and Translations’ Length as Proportion of Full Versions. Standard Deviations in Parentheses.*

<table>
<thead>
<tr>
<th>Message</th>
<th>Full</th>
<th>Translated</th>
<th>Propn of full</th>
<th>Full</th>
<th>Translated</th>
<th>Propn of full</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Texted translations</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>217</td>
<td>197.9 (14.1)</td>
<td>.91</td>
<td>243</td>
<td>228.0 (13.2)</td>
<td>.94</td>
</tr>
<tr>
<td>2</td>
<td>249</td>
<td>236.7 (12.1)</td>
<td>.95</td>
<td>284</td>
<td>267.2 (17.0)</td>
<td>.94</td>
</tr>
<tr>
<td>3</td>
<td>212</td>
<td>195.5 (15.7)</td>
<td>.92</td>
<td>208</td>
<td>193.6 (12.5)</td>
<td>.93</td>
</tr>
<tr>
<td>4</td>
<td>272</td>
<td>259.5 (12.9)</td>
<td>.95</td>
<td>223</td>
<td>210.4 (11.5)</td>
<td>.94</td>
</tr>
<tr>
<td>5</td>
<td>214</td>
<td>173.61 (13.7)</td>
<td>.81</td>
<td>212</td>
<td>202.5 (8.8)</td>
<td>.95</td>
</tr>
<tr>
<td><strong>Overall</strong></td>
<td>232.8</td>
<td>212.7 (13.7)</td>
<td>.91</td>
<td>234.0</td>
<td>220.3 (12.6)</td>
<td>.94</td>
</tr>
</tbody>
</table>

| **Written translations** | | | | | | |
| 1       | 217  | 199.3 (12.4) | .92 | 243 | 225.7 (15.0) | .93 |
| 2       | 249  | 236.0 (13.6) | .95 | 284 | 262.23 (16.7) | .92 |
| 3       | 212  | 195.1 (14.6) | .92 | 208 | 192.2 (12.5) | .92 |
| 4       | 272  | 256.3 (17.5) | .94 | 223 | 206.3 (12.9) | .93 |
| 5       | 214  | 170.5 (12.4) | .80 | 212 | 201.0 (9.3) | .95 |
| **Overall** | 232.8 | 211.5 (14.1) | .91 | 234.0 | 217.5 (13.3) | .93 |
### Table 3

**Descriptions and Examples of the Twelve Textism Classification Categories**

<table>
<thead>
<tr>
<th>Category Name and Code</th>
<th>Description</th>
<th>Example</th>
<th>Standard English Translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Shortening/other clipping</td>
<td>Letters omitted from word beginnings or endings</td>
<td>cause</td>
<td>because</td>
</tr>
<tr>
<td>2 Contraction</td>
<td>Letters (usually vowels) omitted from within words</td>
<td>tmrw</td>
<td>tomorrow</td>
</tr>
<tr>
<td>3 g-clipping</td>
<td>g omitted from -ing endings</td>
<td>studyin</td>
<td>studying</td>
</tr>
<tr>
<td>4 Omitted apostrophe</td>
<td>Apostrophe incorrectly omitted</td>
<td>cant</td>
<td>can’t</td>
</tr>
<tr>
<td>5 Omitted capitalisation</td>
<td>Lower case letters incorrectly used for capitals</td>
<td>oliver</td>
<td>Oliver</td>
</tr>
<tr>
<td>6 Initialism</td>
<td>Phrase/word represented by initial letter of each word or morpheme</td>
<td>btw</td>
<td>by the way</td>
</tr>
<tr>
<td>7 Symbol</td>
<td>Graphemes/symbols used for words, actions, or emotions</td>
<td>:)</td>
<td>happy</td>
</tr>
<tr>
<td>8 Combined letter/number homophone</td>
<td>Number/letter names combined to represent words/phonemes</td>
<td>w8</td>
<td>wait</td>
</tr>
<tr>
<td>9 Single letter/number homophone</td>
<td>Single letters or numbers used to represent words</td>
<td>u</td>
<td>you</td>
</tr>
<tr>
<td>10 Spelling error</td>
<td>Misspellings and typos</td>
<td>ansxer</td>
<td>answer</td>
</tr>
<tr>
<td>11 Non-standard spelling</td>
<td>Irregular spellings, usually phonetic</td>
<td>neva</td>
<td>never</td>
</tr>
<tr>
<td>12 Accent stylisation</td>
<td>Slang or colloquialisms</td>
<td>arvo</td>
<td>afternoon</td>
</tr>
</tbody>
</table>
Table 4

Means and Standard Deviations for Number of Categories Used and Density of Categories for Education Level, Sex and Data Collection Method

<table>
<thead>
<tr>
<th></th>
<th>Number of Categories Used</th>
<th>Density of Categories</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Texted</td>
<td>Written</td>
</tr>
<tr>
<td>High school</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n = 22)</td>
<td>6.23 (2.43)</td>
<td>6.86 (2.49)</td>
</tr>
<tr>
<td>Female (n = 18)</td>
<td>6.67 (3.01)</td>
<td>7.00 (2.81)</td>
</tr>
<tr>
<td>Total (n = 40)</td>
<td>6.43 (2.68)</td>
<td>6.93 (2.61)</td>
</tr>
<tr>
<td>University</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male (n = 14)</td>
<td>6.57 (3.32)</td>
<td>7.64 (2.85)</td>
</tr>
<tr>
<td>Female (n = 32)</td>
<td>6.87 (2.70)</td>
<td>6.94 (2.68)</td>
</tr>
<tr>
<td>Total (n = 46)</td>
<td>6.78 (2.87)</td>
<td>6.93 (2.61)</td>
</tr>
</tbody>
</table>
**Figure 1.** Mean (and standard error of the mean) proportion of each category type to total categories produced, collapsed across education level and data collection method. (Note that category use was constrained by wording of dictated messages.)
Table 5  
*Means and Standard Deviations for Literacy Scores for High School and University Students*

<table>
<thead>
<tr>
<th>Task</th>
<th>High School ($n = 40$)</th>
<th>University ($n = 46$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WRAT-4 Spelling standard score</td>
<td>107.40 (16.70)</td>
<td>110.96 (12.91)</td>
</tr>
<tr>
<td>WRAT-4 Reading standard score</td>
<td>116.40 (22.53)</td>
<td>101.72 (9.43)</td>
</tr>
<tr>
<td>Nonword Reading standard score</td>
<td>105.63 (15.36)</td>
<td>102.83 (8.40)</td>
</tr>
<tr>
<td>Morphological Awareness prop.</td>
<td>.46 (.24)</td>
<td>.58 (.24)</td>
</tr>
<tr>
<td>Orthographic Awareness prop.</td>
<td>.77 (.13)</td>
<td>.79 (.17)</td>
</tr>
</tbody>
</table>
Table 6

Bivariate Correlations between Texting Measures and Literacy Scores (Lower Left) and Partial Correlations Controlling for Texting Frequency (Upper Right)

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>No. yrs texting</th>
<th>No. msg/day</th>
<th>Prop textisms</th>
<th>No. categ.</th>
<th>Textism consist</th>
<th>Spelling</th>
<th>Reading</th>
<th>NWR</th>
<th>MA</th>
<th>OA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. yrs texting</td>
<td>.67**</td>
<td></td>
<td></td>
<td>.05</td>
<td>.18</td>
<td>-.24**</td>
<td>-.08</td>
<td>-.47**</td>
<td>-.20</td>
<td>.28*</td>
<td>.07</td>
</tr>
<tr>
<td>No. messages/day</td>
<td>-.30**</td>
<td>.13</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proportion textisms</td>
<td>-.05</td>
<td>.05</td>
<td>.08</td>
<td>-.72**</td>
<td>.50**</td>
<td>-.21</td>
<td>-.22</td>
<td>-.30**</td>
<td>-.14</td>
<td>-.14</td>
<td></td>
</tr>
<tr>
<td>Number of categories</td>
<td>.12</td>
<td>.14</td>
<td>.13</td>
<td>.75**</td>
<td>-</td>
<td>.21</td>
<td>-.25</td>
<td>-.37*</td>
<td>-.31*</td>
<td>-.14</td>
<td>-.07</td>
</tr>
<tr>
<td>Textism consistency</td>
<td>-.21</td>
<td>-.07</td>
<td>-.002</td>
<td>.50**</td>
<td>.21</td>
<td>-</td>
<td>.01</td>
<td>-.07</td>
<td>-.17</td>
<td>-.16</td>
<td>.03</td>
</tr>
<tr>
<td>WRAT Spelling</td>
<td>.03</td>
<td>-.09</td>
<td>-.32**</td>
<td>-.27*</td>
<td>-.33</td>
<td>.02</td>
<td>-</td>
<td>.56**</td>
<td>.64**</td>
<td>.07</td>
<td>.38*</td>
</tr>
<tr>
<td>WRAT Reading</td>
<td>-.35**</td>
<td>-.46**</td>
<td>-.31**</td>
<td>-.25*</td>
<td>-.37**</td>
<td>-.08</td>
<td>.58**</td>
<td>-</td>
<td>.74**</td>
<td>.02</td>
<td>.19</td>
</tr>
<tr>
<td>Nonword Reading</td>
<td>-.11</td>
<td>-.27*</td>
<td>-.32**</td>
<td>-.29**</td>
<td>-.31**</td>
<td>-.17</td>
<td>.64**</td>
<td>.77**</td>
<td>-</td>
<td>-.10</td>
<td>.33**</td>
</tr>
<tr>
<td>Morph Awareness</td>
<td>.28**</td>
<td>.07</td>
<td>-.29**</td>
<td>-.21*</td>
<td>-.26*</td>
<td>-.14</td>
<td>.23*</td>
<td>.20</td>
<td>.11</td>
<td>-</td>
<td>.11</td>
</tr>
<tr>
<td>Orth Awareness</td>
<td>.04</td>
<td>.05</td>
<td>-.09</td>
<td>-.16</td>
<td>.12</td>
<td>.02</td>
<td>.39**</td>
<td>.25*</td>
<td>.36**</td>
<td>.15</td>
<td>-</td>
</tr>
</tbody>
</table>

*p < 0.05; **p < 0.01
Appendix
Text Messaging Task Sentences for Transcribing

**List A** (character count, including spaces, in parentheses)
1. We never got together on the weekend because of the weather – I missed you! I tried calling about the formal tickets. Can’t wait to celebrate exams being over tomorrow, I hate them. Text your boyfriend – he rocks! (217)
2. I’m totally excited about going to the formal tonight! Thanks for getting the tickets, I forgot. Kate’s buying a great dress which is very expensive. She didn’t lose weight and is still worrying. She’s irritating but whatever, we’ll forgive her. (249)
3. I’m excited to see your excellent pictures. We should get together tomorrow afternoon after the debate or whatever. Kate can’t today because she’ll be studying. Are exams over before the weekend? Bye for now. (212)
4. I’m sorry I forgot to text you tonight. No excuses, please forgive me. Wait at the pictures and I’ll pay for a late movie. I heard Oliver failed his exams because he was cheating. I’ll never stop wondering whether it’s true. I dropped by his house today but no answer. (272)
5. How are you and your girlfriend going to celebrate end of exams? She’s better and prettier than your ex, you’ll be together forever! Maybe we could go dancing together. See you soon. (214)

**List B** (character count, including spaces, in parentheses)
1. I forgot to call Kate for her birthday tonight because I was studying. She’s annoyed and will never forgive me. I hate exams. Maybe we’ll celebrate on the weekend. We’re going swimming together tomorrow, whatever the weather forecast says. (243)
2. Oliver was wondering whether you’re getting back together with your ex boyfriend? He said you kissed him today after the debate and you’ve dropped weight from worrying. You should forgive him for cheating and text him about the formal because it’s not too late to get the tickets. (284)
3. The never-ending exams are over – great! I’m disappointed you didn’t text me, thanks mate. My parents presented me with plane tickets to Melbourne today. Can’t wait to see your excellent pictures tonight. (208)
4. Let’s get together tomorrow between exams, please. I’m excited about my formal pictures. I tried printing them but failed because the format is different on my printer or something. Annoying, but whatever. See you soon. (223)

5. I totally forgot my parents aren’t going to be there on the weekend. I’m very excited to celebrate the end of exams together at their place in Margate. You and Kate could sleep over. Can’t wait. Bye for now. (212)

Target words included in consistency scoring (number of times words repeated across both lists): never (4), whatever (4), over (4), to (11), today (4), tomorrow (4), tonight (4), together (8), for (5), formal (4), forget (4), forgive (4), you (9), your (6), weekend (4), because (6), pictures (4), tickets (4), going (4), wait (4), celebrate (4), Kate (4), excited (4), exams (4), text (4).

Morphological awareness task items

Practice 1: catching, talking, darling
1. agreement, element, employment
2. baker, lover, cover
3. gimmicks, flummox, hammocks
4. wearing, crumbling, cunning
5. weakly, madly, silly
6. punishment, monument, measurement

Practice 2: banker, blender, beaver
7. bathing, gobbling, sibling
8. naked, hiked, baked
9. fries, fuse, fees
10. meanest, smartest, honest
11. snorted, hatred, parted
12. timely, beastly, bully

Orthographic awareness task items

1. gach gatch 9. geetch geech 17. vul vull
2. saff saf 10. sull sul 18. zool zooll
3. vaiff vaif 11. vaick vaik 19. fraff fraf
4. footch fooch 12. week wek 20. meck mek
5. woock wook 13. jaff jaf 21. yeel yeell
6. yach yatch 14. moak moack 22. thooch thootch
7. fraiff fraiff 15. shaiff shaif 23. gack gak
8. thool thool 16. thech thech 24. zul zull
References


