Undergraduates’ attitudes to text messaging language use and intrusions of textisms into formal writing

Abbie Grace and Nenagh Kemp
University of Tasmania, Australia

Frances H Martin
University of Newcastle, Australia

Rauno Parrila
University of Alberta, Canada

Abstract
Students’ increasing use of text messaging language has prompted concern that textisms (e.g., 2 for to, dont for don’t, ☺) will intrude into their formal written work. Eighty-six Australian and 150 Canadian undergraduates were asked to rate the appropriateness of textism use in various situations. Students distinguished between the appropriateness of using textisms in different writing modalities and to different recipients, rating textism use as inappropriate in formal exams and assignments, but appropriate in text messages, online chat and emails with friends and siblings. In a second study, we checked the examination papers of a separate sample of 153 Australian undergraduates for the presence of textisms. Only a negligible number were found. We conclude that, overall, university students recognise the different requirements of different recipients and modalities when considering textism use and that students are able to avoid textism use in exams despite media reports to the contrary.

Keywords
Exams, formal writing, language, SMS, text messaging, textisms, undergraduates

Corresponding author:
Nenagh Kemp, School of Psychology, University of Tasmania, Locked Bag 30, Hobart 7001, TAS, Australia. Email: Nenagh.Kemp@utas.edu.au
Mobile phone use continues to increase seemingly exponentially, with 9.6 trillion text messages sent in 2012 (GSMA, 2013) and an estimated 6.8 billion mobile subscriptions worldwide in 2013 (International Telecommunication Union, 2013). Text messaging is ubiquitous among university students and has become the most popular form of technology-based communication for young adults (Australian Communications and Media Authority (ACMA) 2012; Lenhart, 2010). The spellings and character usage associated with texting and other forms of computer-mediated communication (e.g., email and instant messaging) have been referred to as ‘textisms’ (see, for example, Rosen et al., 2010; Wood et al., 2011), and can take a variety of forms (Drouin and Driver, 2012; Herring and Zelenkauskaite, 2008; Thurlow and Brown, 2003). Some textisms represent pronunciation through alternative spellings (e.g., wanna for want to, nite for night), others omit characters to save time and effort (e.g., mon for Monday, dont for don’t), and others use additional characters to add expression (e.g., ☺, ??!). While the use of these alternative forms may be particularly obvious in text messaging, many have been used historically and predate text messaging, even by a hundred years or more (e.g., wiv for with, 2 for to; Crystal, 2008). In this article we consider concerns about whether the language of text messaging is breaching the boundaries of informal computer-mediated communication and intruding into the more conventional writing and expectations of university students. We report two studies which both address concerns regarding textism use and conventional literacy. In the first study we measured the attitudes of first-year undergraduates in Australia and Canada towards the use of textisms in a variety of contexts, including formal written exams. In the second study we investigated the use of textisms in the formal written exams of a separate cohort of Australian undergraduates (first- to third-year level) to see whether text language was evident in their exam papers.

Textism use and conventional literacy

Textism use gained popularity during the earlier days of computer-based communication and mobile phones. At that time, text messages written on phones were created by pressing each key several times to select the required letter. Although updated phone technology (e.g., touchscreens) has alleviated the pressure on texters to abbreviate words, textism use remains popular across electronic communication forms. For example, recent studies have shown that proportions of textisms range from 16% to 28% of all words in text messages written by university students (Drouin and Driver, 2012; Frehner, 2008; Grace, Kemp, Martin and Parrila, 2012) and approximately 4% of all words in undergraduates’ emails (Frehner, 2008). Several researchers have investigated whether the use of textisms in informal communication is associated with children and undergraduates’ conventional literacy skills (e.g., Plester and Wood, 2009; Powell and Dixon, 2011). Links between literacy and textism use in text messages have been consistently positive in children, with children who used more textisms scoring higher on spelling tasks (Plester and Wood, 2009; Wood et al., 2011) and reading tasks (Coe and Oakhill, 2011). However, results have been mixed for adults. Associations between adults’ literacy task scores and texting or textism use have variously been found to be positive (e.g., Kemp, 2010), negative or neutral in university students (e.g., De Jonge and Kemp, 2012; Grace, Kemp, Martin and Parrila, 2013), or mixed in a more varied sample of adults (e.g., Rosen...
et al., 2010). Despite a lack of conclusive evidence, media concerns have persisted that increased use of text language may be having a negative influence on texters’ general literacy skills (e.g., Mlot, 2013; Thomas, 2012).

**Attitudes towards the appropriateness of textism use**

Concerns that textism use will have a negative effect on formal literacy have been two-fold, both leading to the possibility of textisms appearing beyond text messages and other forms of computer-based communication. First, it has been suggested that textisms may start to intrude into formal writing if students do not recognise the situations in which textism use is appropriate (e.g., Broadhurst, 2008; Henry, 2008; Lleworth, 2010). Very little published research exists to address this concern. However, in a survey of American undergraduates, Drouin and Davis (2009) found that 75% of students believed it to be appropriate to use textisms in informal messages to friends, but only 6% believed it to be appropriate in formal written correspondence with an instructor. While no individual comparisons were made between attitudes and textism use, these students were also asked to compose emails, in which they were found to use significantly more textisms when writing to friends than to professors. Lewandowski and Harrington (2006) devised an experiment in which students assumed the role of a professor and provided assistance and a grade on an essay. Students perceived that essay writers were lacking in skill and effort if the formal emails attached to the essay included (rather than avoided) textisms.

There is some evidence that adults distinguish the appropriateness of textism use not only in terms of formality, but also in terms of modality, or the type of digital message being composed. Specifically, adults have been shown to use significantly higher proportions of textisms in text messages than in emails (Clayton, 2012; Frehner, 2008). Although this difference may in part be due to the greater restrictions on space and keyboard imposed by a mobile phone than a computer, this cannot be the whole explanation; even students who use a mobile phone to compose both message types use more textisms in text messages than emails (Clayton, 2012).

The ability to adjust language to specific situations has been extensively discussed in other contexts, in terms of switching between languages within conversations (e.g., Gardner-Chloros, 2009; Sebba et al., 2011) and adjusting the style of spoken language to formal and informal contexts (e.g., Biber and Finegan, 1994; Joos, 1961). These skills are also apparent when people move between computer-mediated communication and more formal contexts. For example, Jacobs (2008) observed that adolescent females switched between textism use in instant messages and textism-free formal English in school assignment work. While it is likely that students are able to adjust their written language to include textisms in text messages and avoid them in formal writing, very little research has examined individuals’ views on the appropriateness of intentional textism use, either within or beyond computer mediated communication. In general, it has been assumed that textism use is largely accepted in the casual register of text messages but that textisms should not appear in formal written work. This means that students need to adapt their written language as they move between contexts. In the current research we used questionnaires to probe the attitudes of undergraduate students towards the use of
textisms in formal writing, exploring the presence or absence of textisms rather than the why and how of textism use in other contexts such as informal text messages.

**Textism intrusions into formal exams**

The second dimension to media concerns is that with sufficient exposure to text messaging, traditional orthographic representations of words in students’ mental lexicons will be overwritten by their text-like versions (e.g., Friess, 2003; Humphrys, 2007; Woronoff, 2007). If this is indeed the case, we might expect again to see textisms intruding into students’ formal writing, especially in the pressured situation of formal exams. There is much anecdotal evidence for the intrusion of textisms into students’ writing (e.g., Broadhurst, 2008; Henry, 2008), but empirical evidence is sparse. Of the published research that does exist, some has relied on educators reporting on formal writing that they have marked. For example, 25 lecturers and professors of English at a university in the USA reported seeing textism-like intrusions into formal written work (National Council of Teachers of English, 2003). Similarly, of 22 Grade 8–9 English teachers surveyed in South Africa, the majority agreed with the premise that using text language had a negative effect, in that it led students to have lower grades and a reduced knowledge of Standard English (Geertsema et al., 2011). However, when asked about specific textism types encountered in assignments (e.g., emoticons, such as :-/ to represent scepticism, and shortenings, such as aft for after), most of these teachers reported that they ‘seldom’ observed any of the listed textism types, although they did report ‘regularly’ observing non-conventional spellings (e.g., nite for night). Other studies have asked students to self-report their use of textisms in formal writing. A Pew survey reported that 64% of teenagers in the USA said they had used informal writing styles in their school work, with 38% saying they had used textisms such as LOL (for laugh out loud), and 25% saying they had included emoticons (e.g., ☺) (Lenhart et al., 2008). Mildren (2010) surveyed US middle and high school students, as well as parents and teachers, and found that students who reported using more textisms in their school work had better conventional writing skills, but students who text messaged more often reported finding it more difficult to adjust their writing style between home and school contexts.

Data from experimental tasks have also shown textism intrusions, but to a more limited extent than suggested by self-report studies. Adults from a range of educational levels who were asked to write a formal complaint letter to a company (average length about 300 characters) produced an average of only about 2.5 textisms per writing sample, most of which were lowercase i in place of I, or words with omitted apostrophes (Rosen et al., 2010). These are the types of textisms which many phones now autocorrect. Similarly, in a study by Drouin and Davis (2009), only 18% of American college students who were asked to write formal emails to instructors used any textisms and the highest use observed was only four textisms in an email. However, 51% of students used at least one textism in the email they were asked to write to a friend, with up to 14 textisms produced per informal email (types of textisms not specified). Palasz (2012) found that US high school students did not use textisms at all in formal writing samples, despite most of these students reporting that they used textisms in text messages. One previous study investigated textism intrusions in a naturalistic context: Shafie et al. (2010) studied the
exam papers of Malaysian undergraduates in English units. The authors state only that, ‘Few SMS abbreviations such as “wut”, “u” and “ar” appeared on the examination scripts’ (p. 30) and note anecdotally that textisms seemed to appear in the papers of students with a relatively high number of spelling errors. Taken together, these experimental findings suggest that, despite popular concerns and anecdotal data, the inclusion by students of textisms in formal work is minimal at most. However, to date no study appears to have provided a specific count or analysis of the textisms that may be present in students’ naturalistic formal writing.

The present studies

As established in the review above, little information exists to address comprehensively concerns that students are unwilling or unable to avoid textism use in their formal writing. We conducted two studies, one to examine university students’ views on the use of textisms in various situations and one on their actual use of textisms in a formal academic setting. Specifically, in Study 1 we measured undergraduates’ opinions of textism use by inviting students to rate the perceived appropriateness of textism use in a variety of formal and informal situations, including in a text message to a friend and in a formal written exam. In Study 2 we measured the intrusion of informal text messaging-like spellings into students’ formal written exams, to generate real-world evidence of their attitudes in practice.

Study 1

In this study we measured undergraduate students’ views on the appropriateness of textism use in a range of contexts. We varied the formality in terms of the closeness of the recipient (in both social distance, such as between a friend and a stranger; and age, such as between sibling and an older family member) and the type of communication involved (including text messages, emails, lecture notes and exams). The questionnaire we used invited ratings on a Likert scale, rather than asking students to provide a response as to whether textism use was appropriate or not, as was done in Drouin and Davis’s (2009) survey. If, as suggested by previous research, students are aware of different registers of language and think that textisms are appropriate in some contexts but not others, students should rate textism use as more appropriate in less formal situations (e.g., in a text message to a friend) and less appropriate in more formal situations (e.g., in an email to a lecturer). In contrast, if, as suggested in the popular media, students have forgotten or never learned the need to differentiate registers of language for different situations, students should rate textism use as substantially the same across more formal and informal recipients and writing types.

Method

Participants. Participants were convenience samples of first-year psychology and educational psychology undergraduates from two similar urban universities, one in South Eastern Australia and one in Western Canada. There were 86 Australian students (73%
female), mean age 23.3 years ($SD = 8.2$) and 150 Canadian students (77% female), mean age 22.5 years ($SD = 4.2$). The higher proportion of females than males reflects a gender imbalance typically seen in introductory psychology courses and many studies of text messaging language (e.g., Drouin and Driver, 2012; Ling and Baron, 2007; Thurlow and Brown, 2003). All students were regular users of text messaging and native speakers of English. The study had ethical approval from both universities and students provided informed consent. Students were given course credit for participation.

**Materials and procedure.** Participants completed a questionnaire (see Appendix 1), as part of a larger study, which included questions regarding demographic information and the completion of text messaging tasks. As part of this questionnaire, participants were asked to rate how appropriate they thought it was to use textisms in the modalities of text messages, email, online chat and university work, to recipients ranging from a friend to a stranger. (Some combinations of modality and recipient such as a text message to a lecturer, or university work written for a friend, were omitted because they would be unusual or meaningless). Responses were recorded on a 5-point Likert scale ($1 = \text{not at all appropriate}$ and $5 = \text{entirely appropriate}$). Students completed questionnaires individually or in pairs in a quiet university room.

**Results and discussion**

Participants’ mean ratings for how appropriate they thought it was to use textisms in various situations were almost identical for the two countries (confirmed by independent-samples $t$-tests). Therefore, appropriateness ratings were combined for Australia and Canada and these are reported in Figure 1.

As can be seen in Figure 1, ratings differed with recipient for each message type, with a clear decrease in appropriateness ratings from less formal social situations (in terms of both recipient, e.g., writing to a friend; and modality, e.g., taking lecture notes) to more formal social situations (e.g., writing to a stranger, completing formal university assessments). In contrast to what might be expected from anecdotal reports noted earlier, all but 11 of the 236 students rated textism use in both exams and typed assignments as ‘not at all appropriate’.

A series of paired-sample $t$-tests were calculated to check for significant differences between message recipients and modalities. Students clearly differentiated between recipients when rating the appropriateness of textism use. For every comparison for which data were available, textism use was rated as more appropriate in all modalities of message sent to friends than siblings; to siblings than older family members; and to older family members than to strangers (all $p < .001$). The only exception was that the use of textisms in emails was rated the same ($M = 3.7$) when sent to friends or siblings. While differences across modalities alone were not a focus of this study we note that, regardless of recipient, appropriateness ratings for textism use were also significantly greater for text messages than for internet chat and for chat than for emails, across all comparisons (all $p < .001$). More importantly, textism use was also rated significantly more appropriate in lecture notes than in either type of formal university assessment, namely assignments and exams ($p < .001$).
Because we did not have an equal balance of genders in our sample, we checked whether males and females differed in their attitudes to textism use. However, a series of one-way analyses of variance (ANOVAs) revealed no significant gender differences in ratings other than with regard to the appropriateness of using textisms in one’s own lecture note-taking, for which males rated textism use as more appropriate ($M = 3.53$) than females ($M = 3.06$), $F(1, 234) = 4.91, p = .03$. Taking one’s own notes was considered as the most informal context in the questionnaire, and since this is the only scale on which we observed a gender difference it seems that the gender imbalance in the sample is unlikely to have any implications for interpreting students’ views on the appropriateness of textism use for more formal types of writing.

The finding that participants varied in their ratings between different recipients and modalities suggests that not only is textism use considered inappropriate in some contexts but also that it is quite acceptable, and perhaps even expected, in others. In some social groups, textism use may be a mandatory component of convergent informal communication, such that to write only in Standard English would transgress the social expectations of many adolescents and young adults. These views were reflected in the informal

![Figure 1](image-url)
comments of some participants in the current study, who noted that they felt there was an expectation to reciprocate with textisms in response to the textism-rich messages that they received. Haas et al. (2011) discuss the ‘intertextuality’ of technology-based communication, emphasising that social influences dictate the style and content of messages as the writers co-create the conversation. Lenhart (2010) reported that these expectations differ between genders, in that girls surveyed in the USA reported sending and receiving more than twice as many messages as boys did per day. Gender differences were also found in message content, specifically that girls were more likely than boys to send texts simply to say hello, as well as to discuss personal matters in long text exchanges. Furthermore, Garrison et al. (2011) have suggested that norms in computer-mediated communication must be assessed within their own social landscape rather than in comparison to Standard English. The use of textisms and varying writing styles within text messages and other computer-mediated communication modalities continue to provide opportunities for the study of language in an increasingly technologically influenced social world.

In sum, participants’ ratings of the appropriateness of textism use varied greatly across recipients and modalities. Across modalities, textism use was rated as appropriate in messages to friends and family members but less appropriate in messages or writing intended for strangers and lecturers. Similarly, students rated textism use as acceptable while taking lecture notes but they almost uniformly believed textism use in formal assignments and exams to be entirely inappropriate. It appears that these university students, at least, have a conventional grasp of how the appropriateness of textism use varies across contexts.

As is common in university psychology departments, the students in this study participated in exchange for course credit. Giving course credit for research participation ensures a greater proportion of students from the population participate than if involvement were entirely voluntary. However, this practice raises broader ethical issues about the nature of such participation, linked as it is to compulsory unit requirements and which contributes to academic marks. Nevertheless, these students were able to select from a range of studies in which to participate and they also had available the option of completing an essay assignment on ethics in research instead. Furthermore, the provision of course credit encourages not only a greater number but also a greater range of students to participate. Having exclusively voluntary participation would presumably attract a less representative sample of students – that is, those who were particularly interested in contributing to research on this topic, possibly because they were particularly fond of using textisms or, contrarily, because they were particularly keen on avoiding them. It is still possible that students who chose to participate in this study may have had more interest in texting, and thus potentially more extreme views on the subject, than the general student population. However, the fact that all students in the year group were required to participate in some kind of research mitigates this concern to a great extent. Alongside the potential ethical concerns, the requirement to participate in research does provide undergraduate students with the opportunity to experience the practical application of a range of research questions and to interact with staff and student researchers in their own department. The broader ethical and theoretical implications of research participation raise questions that will be debated for as long as researchers require participants in their studies; but the present sample of participants does seem be reasonably representative of their cohort.
Study 2

In Study 1 we measured students’ opinions on when they thought textism use was appropriate; in Study 2 we measured the actual behaviour of a different group of students, in the formal situation of the university examination. Specifically, we assessed undergraduates’ formal written exams for intrusions of textisms. This forms the first published study, to our knowledge, to estimate the extent of the intrusion of textisms by calculating the number of textisms observed as a proportion of total words written, rather than relying on self-reports or experimental situations. On the basis of the very limited experimental and naturalistic evidence available in previous research (e.g., Drouin and Davis, 2009; Palasz, 2012), we expected to find few textism intrusions in these undergraduate exam papers.

Method

Participants. Participants were a different group of 153 undergraduate students (79% female) from the same urban South-Eastern Australian University as in Study 1, in the first, second or third year of their degree. This study had ethical approval from the university and students provided informed consent for their exams to be examined for textisms (no course credit was given for participation in this study, because active involvement was restricted to returning of a consent email).

Materials and procedure. Three hundred and three papers for final exams which had been completed in previous semesters (late 2009 and early 2010) were examined. The exams were from four disciplines (psychology, management, Aboriginal studies, and zoology) and the papers contained a total of approximately 533,500 words. These exam papers all included long answer and essay sections which were checked for intrusions of textisms. Previous analysis of textisms in text messages has often involved categorising each textism according to the transformation from a conventional word or phrase, such as the ‘contraction’ of message to msg, or the addition of ‘extra letters’ to transform please to pleeease and ‘emoticons’ such as ☺ (e.g., Herring and Zelenkauskaite, 2008; Ling and Baron, 2007; Rosen et al., 2010). In the current study, textisms were coded according to a scheme used by Thurlow and Brown (2003) and subsequently used in modified form by a number of researchers (e.g., Drouin and Driver, 2012; Grace et al., 2012; Plester and Wood, 2009) as shown in Table 1. It should be noted that this table does not include an exhaustive list of textism categories, but includes only the types of textisms that we observed in the exam papers studied here.

There are three features of written language that have been counted as textisms in previous text-messaging studies that we did not count as textisms here. First, we did not count the abbreviation of and to + or & as a textism. These symbols were used extensively in exam papers, but are rare in text messages analysed for other studies (e.g., Neville, 2003; Plester and Wood, 2009). They are much more likely to reflect time-saving in handwriting than a transfer of a text messaging abbreviation. Second, we did not count misspellings in exams as textisms (e.g., seerate for separate), although some text-messaging studies have included a category of misspellings (e.g., Drouin and Driver, 2012; Thurlow and Brown, 2003). Third, we did not count the widespread errors with possessive apostrophes (e.g., the researchers theory for the researchers’s theory) as
textisms because these apostrophes are so commonly omitted in standard writing by undergraduates (Hokanson and Kemp, 2013). However, we did follow previous research on the use of textisms (e.g., Grace et al., 2012; Plester and Wood, 2009) in counting the much rarer omitted contractive apostrophes (e.g., don’t for don’t), but we acknowledge that these do not necessarily represent the intrusion of textisms into formal writing.

Results and discussion

Table 1 also shows descriptive statistics for textism types observed in these exams, with examples of textism use for each category.

Only a very small percentage of words written in these exam papers could be counted as textisms and 43 of these occurred in a single student’s paper. This student’s paper contained contractions (e.g., btwn for between), shortenings (w/ for with), symbols (@ for at and # for number) and homophones (4 for for). Overall, the proportion of textisms of all words in the written exams by all participants was a tiny 0.02% and, with the outlying student’s results excluded, was reduced to only 0.01% (an average of approximately one textism in every 7200 words). The remaining textisms seen in the other students’ exams are summarised in Table 1. Various other types of textism types that have been observed in previous research on actual text-messages (e.g., Grace et al., 2012; Hokanson and Kemp, 2013) were not seen in the exam papers viewed in this study. The textism types not seen in these exam papers included g-clippings (e.g., doin for doing), combined homophones (e.g., 2nite for tonight), initialisms (e.g., atm for at the moment), accent stylisation (e.g., gonna for going to), and extra capitals (e.g., TOGETHER for together). While single homophones such as 2 for two (which were observed in the current exam papers) may have been used before the advent of text messaging, textisms such as combined homophones, initialisms and expressive symbols seem to have stronger links with text language. It is not clear whether some of the unconventional spellings observed here (e.g., the omission of capitals, such as at the start of a sentence, and of apostrophes, as in havent for haven’t) represented a ‘creeping’ of textisms into formal writing or a simple saving of time in the haste of writing under examination conditions. In other cases, such

<table>
<thead>
<tr>
<th>Textism type</th>
<th>Example</th>
<th>No. of occurrences (in 533,500 words)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contractions</td>
<td>ppl for people</td>
<td>39</td>
</tr>
<tr>
<td>Shortenings</td>
<td>recog for recognised</td>
<td>13</td>
</tr>
<tr>
<td>Omitted apostrophes</td>
<td>havent for haven’t</td>
<td>26</td>
</tr>
<tr>
<td>Single homophones</td>
<td>2 for two</td>
<td>9</td>
</tr>
<tr>
<td>Other symbols</td>
<td>@ for at</td>
<td>13</td>
</tr>
<tr>
<td>Expressive symbols</td>
<td>☻ , :, x</td>
<td>11</td>
</tr>
<tr>
<td>Extra punctuation/letters</td>
<td>!!!!, …ahhh…</td>
<td>3</td>
</tr>
<tr>
<td>Omitted capitals</td>
<td>i for I</td>
<td>3</td>
</tr>
<tr>
<td>Overall</td>
<td></td>
<td>117</td>
</tr>
</tbody>
</table>
as the use of expressive symbols, there seemed to be a definite transfer from computer-mediated communication, since these examples do not occur in conventional writing. For example, all eleven expressive symbols observed in the exams were emoticons and six of these were included in sidenotes to the marker (e.g., *continued 3 pages on ... Sorry :o*). In other cases, smiley faces were used to emphasise or illustrate points (e.g., with reference to achieving ecological harmony, or to falling in love). It is clear that in some of these essays, textisms appeared as a deliberate act to enhance communication.

Overall, however, the negligible proportion of textism intrusions found in students’ formal exams in the current study was even smaller than seen in previous research where students wrote essays and emails under experimental conditions (e.g., Drouin and Davis, 2009; Rosen et al., 2010). The current findings suggest that students remain capable of discerning conventional spellings from textisms and of knowing when to avoid using the latter.

Although students used very few textisms in their exams, we noticed that they used a greater number in their emails giving consent to have their exams included in the study. In the 126 emails that we gained student permission to analyse, we found 41 textisms (4.8%) in a total of 855 words. This post hoc analysis at least confirms that these students do use textisms in other settings; here, even in an email response to an unknown researcher. The difference between the proportions of textisms used in exams and emails may reflect the fact that words commonly written as textisms in informal or conversational text messages (e.g., *i* for *I*) are less likely to be used in formal exams. Regardless, it is clear that even students who used textisms in their emails were quite able to avoid using textisms in their formal written exams. This conclusion supports previous research in which surveys and experimental tasks have shown that few textisms are found in formal writing (e.g., Palasz, 2012; Rosen et al., 2010).

It should be noted that the invitation to students to have their past examination scripts included in this study was sent out to many more students than the number who eventually replied to grant consent. Further, the number of students who were initially invited to participate was also limited by the initial agreement of the lecturer of each course to have their past students contacted about this study. Although exact invitation to participation ratios are not available, it is possible that students who were particularly self-conscious about their exam performance, writing style or spelling ability were less likely than other students to provide consent for their exam papers to be included, despite the anonymous nature of the data collection. However, as this study included over 300 papers taken from three year levels and four different faculties, we are confident that the exams considered here represent the writing of students with a range of academic experience and areas.

**General discussion**

Concerns that textism use will negatively affect students’ literacy skills have been expressed in a large number of media reports (see Thurlow, 2006), but investigations of potential effects of texting on students’ formal work have been largely restricted to questionnaires (e.g., Lenhart et al., 2008; Mildren, 2010) and laboratory-based experimental studies (e.g., Drouin and Davis, 2009; Rosen et al., 2010). However, except for a brief
report by Shafie et al. (2010) of ‘few’ textisms appearing in the exams of Malaysian students of English, to our knowledge no measurement of real-world intrusions of textisms into formal written work has yet been undertaken. In Study 1 we too examined undergraduates’ views of textism use in a variety of contexts, by means of a questionnaire, from which we found that participants rated textism use as less appropriate across increasingly formal situations. This finding is similar to that of Drouin and Davis (2009) who reported students’ opinions that textism use was more appropriate in text messages than formal emails. Students in the current study suggested that textism use was more appropriate when sending a message to a friend or sibling, than to an older family member or than to a stranger. Students also rated textism use as appropriate when taking lecture notes, but not at all appropriate when writing formal assignments and written exams. These ratings varied between modalities, with textism use rated significantly more appropriate in text messages than instant messages (online chat) and in instant messages than emails. Differences between appropriateness ratings reached statistical significance in almost every comparison. This pattern of ratings is perhaps unsurprising given that previous researchers have observed higher proportions of textisms in text messages than emails (Clayton, 2012; Frehner, 2008), which may be due to differences in text-entry technology between computers and phones as well as the differences in message content in texts versus emails.

In Study 2 we assessed undergraduates’ formal written exams for textism intrusions. In Study 1, students were able to recognise where textism use is and is not appropriate: we wanted to confirm this in a real-world setting. If concerns for students’ spelling abilities being threatened by the use of unconventional word forms in text messages are justified, this might be evident in the written work that they produce, especially under the pressure of a written exam. As predicted, however, although the students’ exam papers were by no means free of conventional spelling errors (such as definite and verticle), we found only a negligible number of unconventional spellings that might be considered as textisms. This is despite the fact that these students did use textisms in their consent emails. Furthermore, fewer textisms were found in their consent emails than the proportions of textisms generally reported in studies of undergraduate students’ naturalistic text messages (e.g., 28% textisms in Drouin and Driver, 2012; 16-19% in Grace et al., 2012; 19% in Thurlow and Brown, 2003). These results fit well with the ratings of students in the first study who, on the whole, deemed textism use in exams to be inappropriate and also deemed textism use in formal emails as less appropriate than in informal text messages. While educating students as to when and where textism use is appropriate has been recommended before (e.g., Crystal, 2008; O’Connor, 2005; Sweeney, 2010), in this case at least it seems that these undergraduates were quite capable of differentiating between settings without explicit instruction, as discussed further below. However, we note that university students have regular practice with writing for both formal and informal audiences. They often need to switch between registers; for example, between producing formal university assignments and exams and engaging in informal digital communication with friends and family. Future researchers could investigate whether decisions about the appropriateness of textism use would be any different in adults who had little practice in switching between formal and informal registers, and/or who rarely
needed to use formal writing because of the nature of their work, social, or educational background.

The present results are important given the anecdotal concerns expressed previously (by news writers and educators alike) that textisms are appearing in formal school work (e.g., Henry, 2008; National Council of Teachers of English, 2003). The lack of textisms in university-level exam transcripts may provide evidence of educators’ efforts to inform younger students regarding formal writing standards and students’ own development, as they mature, of the ability and willingness to avoid textisms in formal writing.

Taken together, the results of our two studies suggest that, thus far, textism use—whether in text messages or other forms of computer-mediated communication—has not undermined university students’ ability to write words using conventional spelling when appropriate. It is possible that adults in similar age groups who have had limited exposure to further education may be more susceptible to any influence of textism use on literacy skills. Therefore, studies that encompass non-university populations might be a valuable extension to this investigation (e.g., Rosen et al., 2010). A limitation of the present results is that it is not clear whether students’ opinions about the appropriateness of textism use in different contexts would translate into differences in actual textism use across recipients or modalities. Thus, in future, researchers could collect and analyse messages according to their modality and intended recipient, to examine how opinions about textism use compare to message creation in the real world across communication forms.

Whether textism use is appropriate in any context beyond informal communication (e.g., smiley faces in emails to university lecturers) is a debate that may yet be renewed as computer-mediated communication continues to increase in popularity. The metalinguistic skills required to differentiate communication styles across contexts may even be providing opportunities for growth in students’ broader understanding of literacy concepts. Opportunities exist for teachers to address intentionally issues of formal and informal writing in the classroom (Roschke, 2008; Turner, 2009) as well as other literacy concepts such as the larger issue of language change over time. To this end, new forms of written language used in text messaging itself may also be worthy of exploration in classroom studies of computer-mediated communication.Expressive components such as emoticons (e.g., smiley faces), place fillers (e.g., um ...), extra punctuation (e.g., ??!!) and invented words and spellings (e.g., blaaaargh, helllllooooo) add novel communicative potential to written texts by giving non-verbal cues and even capturing tone of voice (Herring, 2001; Shortis, 2007).

Future studies could consider the inclusion of focus groups and interview data to allow for more detailed exploration of motivations for textism use and the function of the variety of textism types that students use. It seems to us that the few textisms that did appear in the exam papers considered in this study were used as abbreviations for efficiency, or to add emphasis and expression to the writing. However, asking students to explain the motivation behind their use of such spellings and symbols would allow more definite conclusions to be drawn. Further questions could also establish students’ awareness of textism use and how (or whether) they differentiate (what we would identify as) textisms from other forms of abbreviation.
In future studies it would be valuable to extend the age range of participants, to examine the understanding of formal versus information writing in children, often the focus of media concerns about the negative effects of textism use. Future researchers could also consider a greater range of writing contexts, such as less important written assessments (such as in-class tests or responses to on-line class discussions) and email communication with university instructors. It will also be important to investigate the attitudes towards textism use of adults outside the university system (e.g., as studied by Rosen et al., 2010), to see if these adults are more or less likely than their university-student peers to differentiate between the use of textisms in different contexts. These kinds of studies should also take into account differences in the language of formal and informal written communication in light of ongoing technological changes. For example, will the literacy of the future require the ability to write at different levels to suit different technological and social contexts? Instead of formal language being ‘ruined’ by textism use, is it simply being differentiated into a wider variety of communication styles, and if so, how do we educate appropriately in this new linguistic landscape? How do young people who have grown up surrounded by these technologies conceptualise and adapt their online communication styles and language? These and other questions about how we interact with communication technology will continue to develop as the technology itself continues to change.

As children begin texting at earlier ages, potentially prior to the cementing of early reading and writing skills, the importance of addressing formal and informal language in the classroom will continue to increase. Therefore, while the current study provides real-world evidence to address past media concerns that textism use is somehow ‘damaging’ English literacy, it is recommended that monitoring continues of the possible use of textisms in formal writing of younger students and non-university adults. However, it is clear that overall undergraduate students, at least, are able to discern levels of appropriateness for textism use in a range of contexts, and appear both willing and able to avoid textism use in formal writing. The skills required to recognise contexts in which textism use is – and is not – appropriate, and to switch between communication styles, is worthy of continued study, especially as informal written communication becomes a greater part of our everyday lives.

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**Author biographies**

**Abbie Grace** is a PhD student in Psychology at the University of Tasmania. Her doctoral research is designed to investigate the effects of collection method, technology, and individual factors on the use and nature of university students’ text-messaging language use.

**Nenagh Kemp** is a Senior Lecturer in Psychology at the University of Tasmania. Her research interests include the use of written language in mobile technologies, the development of spelling skills in children and adults, and the idiosyncrasies of Australian English.

**Frances Heritage Martin** is an Associate Professor in Psychology at the University of Newcastle. She is interested in cognitive processes, including word recognition and reading processes, and the behavioural and electrophysiological correlates of brain and behaviour.

**Rauno Parrila** is a Professor of Educational Psychology at the University of Alberta. His research interests include the psychological, linguistic, and social correlates of academic and reading development, and the identification and remediation of reading, attention, and problem solving difficulties in children.
Appendix I

Appropriateness ratings

How appropriate do you think it is to use text-message-style abbreviations in each of the following type of message? (e.g., “u” for you, “lol” for laughing out loud, smiley faces)

1= Not at all appropriate 2 = Not really appropriate 3 = It’s okay
4 = Reasonably appropriate 5 = Entirely appropriate

1. Texting a friend
2. Texting a family member of your own age
3. Texting an older family member
4. Texting someone you don’t know (e.g., to respond to a for-sale ad)
5. Emailing a friend
6. Emailing a family member of your own age
7. Emailing an older family member
8. Emailing a lecturer
9. Emailing someone you don’t know (e.g., to respond to a for-sale ad)
10. Instant messaging/online chat to a friend
11. Instant messaging/online chat to a family member your own age
12. Instant messaging/online chat to an online company website (e.g., to arrange accommodation)
13. While taking lecture notes
14. In a handwritten exam
15. In a typed assignment