CHAPTER 10

Digital Childhoods and Literacy Development: Is Textspeak a Special Case of an "Efficient Orthography"?

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Over the past decade, the use and ownership of mobile phones and other personal digital devices have become increasingly common for adults, children, and adolescents. The advent of more affordable handsets with full keyboards and touchscreens has enabled a younger generation to embrace this technology (Skierkowski & Wood, 2012). The increased use of personal digital technology has changed the way in which people communicate. Holtgraves (2011) has observed that text messaging (SMS) is a particularly interesting phenomenon as it merges features of written and oral communication. That is, texting and instant messaging are mobile, highly interactive, and can take place in real time. They also *extend* opportunities for social contact and interaction, providing a means of remaining in contact with others where the technology is supported (Skierkowski & Wood, 2012). These methods of communication enable users to coordinate activities, maintain social networks, and share information, as well as offer a distracting activity in itself by filling dead time (Tossell et al., 2012). For example, some children have noted that they find themselves sending digital messages at times when they would not normally phone or otherwise interact with people (Wood, Kemp, & Plester, 2014).

For children in the United Kingdom, the use of mobile phones, texting, and other forms of digital messaging is now commonplace. In 2005, Jackie Marsh suggested that "Digikids" would spend their preschool years familiarizing themselves with mobile phones and would therefore enter school with extensive experience of this type of technology. Consistent with this

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prediction, toy versions of mobile phones for preschool children are easily found, and there is evidence that some children now own their own phones at 5 years of age (Wood, Kemp, & Plester, 2014) with other preschoolers well versed in their use through exposure to preschool apps available on smartphones.

As mobile devices have become increasingly commonplace, concerns have been raised by the media about the use of such technology by children and young people (see Crystal, 2008; Thurlow, 2006; Thurlow & Bell, 2009, for overviews). Some media coverage has included concerns about children not getting enough sleep due to late night phone use and even the dangers associated with inattention when crossing roads. However, the primary concern has centered on the impact that the growing use of text messaging could have on language itself (e.g., Humphrys, 2007) and children's language development in particular. For example, suggestions have been made that the use of abbreviations and alternative spellings, which are a feature of communication via text and instant messaging, ultimately pose a threat to children's spelling and grammatical development (e.g., see Woronoff, 2007). Such assertions have not been made tentatively; rather, they have been asserted as inevitable truths, despite the lack of evidence at the time to support such strong claims.

However, our own work and that of others working in this field have not supported these concerns and have in fact either shown positive or null associations between the use of texting slang and literacy development (e.g., Coe & Oakhill, 2011; Plester, Wood, & Joshi, 2009; Wood, Jackson, Hart, Plester, & Wilde, 2011; Wood, Meachem, et al., 2011; Wood, Kemp, Waldron, & Hart, 2014; Wood, Kemp, & Waldron, 2014). The question of why there has been little evidence of any detrimental impact is one that we have explored in our papers. However, there is scope to understand further the findings we obtained in these studies if we consider the proposition that the linguistic forms that many children use when writing in digital contexts represent a type of "efficient" orthographic system.

AN EFFICIENT ORTHOGRAPHY

An "efficient orthography" is one that affords optimal conditions for individuals to decode new words effectively and which also enables automatized reading for experienced readers. To permit these dual affordances, an efficient orthography is one that comprises distinct and specific word units with a consistent orthographic configuration. In other words, an efficient orthography is one that permits self-teaching to occur because of the

transparency and predictability of its orthographic units and their correspondences with phonology (Share, 1995). Through repeated exposure to texts in such orthographies, readers become more proficient and efficient at decoding texts, and when new words are encountered, the features of the orthographic system permit its users to successfully decode and extract meaning from these novel items and to easily acquire and retain the spellings of those new items. The efficiency of an orthographic system can account for cross-linguistic variations in levels of literacy difficulties and speed of literacy acquisition (e.g., Seymour, Aro, & Erskine, 2003; Ziegler, Perry, Ma–Wyatt, Ladner, & Schulte-Korne, 2003), and in particular can explain why the levels of reading difficulty experienced by children learning to become literate in English are so pronounced.

The concept of an efficient orthography is one that is particularly relevant in the context of literate activity within digital media. That is, over the last 20 years, we have seen the emergence, development, and maintenance of an orthographic system referred to as *textspeak*. Textspeak is a version of an established orthography (such as English) where alternative, abbreviated, and simplified spellings are used (see Crystal, 2008, for examples of textspeak across different language contexts). Within English textspeak, users typically employ alternative representations of words or sentences (known as "textisms") alongside more conventional orthographic units (e.g., "Hi! Hope everything OK. U goin out 2nite?"). Textisms can be phonetic in nature (e.g., "2nite" for "tonight") but can also comprise truncated and abbreviated word forms that represent words or entire phrases (e.g., "U" for "you," and "imho" for "in my humble opinion"). Table 1 summarizes the different types of textisms that have been identified, to illustrate the range of adaptations that are used. These forms were originally used to keep text messages short and therefore within the character restrictions of the early mobile phones. Contemporary phones no longer restrict text message length in the same way, and the prevalence of standard keyboard interfaces on phones (as opposed to the original "multipress" numerical keypads) led to speculation that the use of such abbreviations would decline and eventually disappear. However, this situation has not occurred, and textisms continue to be readily observable in text messages and other forms of written digital communication, such as instant messaging, social media posts, and even email communications. Moreover, as Crystal (2008) has noted, the use of similar abbreviations has been noted in examples of writing that predate digital technologies.

As Table 1 shows, even within phonetic textisms, the standard English orthographic system is disrupted through the use of numerical characters as

Table 1 Examples of types of text abbreviation or "textisms" used

Category of textism	Examples
Shortenings	Feb, bro
Contractions	txt, chldrn
g-Clippings	shoppin, sleepin
Other clippings	shal (shall), hav (have), Cov (Coventry)
Omitted apostrophes	wont, didnt, mums
Acronyms	GB, ITV
Intialisms	rofl (rolling on the floor laughing),
Symbols	☺ @ & x o
Emoji	💩 😘
Letter/number homophones	2nite (tonight), U (you), R (are)
Nonconventional spellings	nite, fone
Accent stylization	sup (what's up), kewl (cool), wiv (with), innit (isn't it)

graphemes (e.g., *l8r* for "later") and through the representation of national and regional accents rather than received pronunciation (e.g., "anuva" for "another," "kewl" for "cool"). Even punctuation can be substituted by novel markers such the use of emoticons and emojis, which have been observed to be used consistently as substitutes for full stops or commas (e.g., Wood, Kemp, Waldron & Hart, 2014), and which are arguably more successful than conventional punctuation at conveying and disambiguating any nonliteral meanings intended by the author.

As such, it can be argued that the use of textspeak and of textisms in particular, affords a particular context for examining the claims of self-teaching theory. That is, young people who are new to texting are exposed to an orthographic environment that shares some regularities and tokens from their more familiar language system, but which also incorporates novel items. It should be noted that in English textspeak, phonetic textisms tend to be the most frequently used type (Plester, Wood, & Bell, 2008; Wood, Kemp, & Plester, 2014), and in published studies of naturalistic (as opposed to elicited) text messages, there have been no reported examples of young people writing all their text messages in textisms only. Therefore, a typical primary school aged child's text message might comprise a sentence in which approximately 30–40% of the words are textisms (e.g., Wood, Meachem, et al., 2011) and of which the majority of those textisms will be phonetic in nature (Plester et al., 2008; Wood, Kemp, & Plester, 2014). As a result,

in English at least, the use of textisms should facilitate self-teaching as they usually follow a more transparent and simplified set of orthographic principles than the opaque orthographic system from which they have been derived. However, just as in normal reading, some novel words may be characterized as "foreign" in the sense that they are based on a set of orthographic principles that are not consistent with the regularities of the language in which they are contextualized (e.g., symbols and initialisms).

TEXTISM USE AND LITERACY SKILLS

Research into the use of text abbreviations has shown that the children's use of textisms in SMS messages is positively associated with literacy outcomes and with growth in spelling ability in particular (e.g., see Plester et al., 2009; Wood, Jackson, et al., 2011; Wood, Meachem, et al., 2011). It was originally suggested that textism use may contribute to children's reading and spelling acquisition because it affords children an environment in which they can rehearse their understanding of letter-sound correspondences and improve their phonological processing abilities. What we did not consider at the time was the possibility that by augmenting their writing with textisms, children were potentially creating a more optimal orthographic environment for self-teaching of standard English words to occur within, and that it could have been this factor that explained the apparent additional benefits of textism use on children's attainment in reading and spelling.

Other explanations were originally offered for the benefits of text messaging on literacy, but these were not substantiated. For example, one of the explanations that we suggested when trying to account for the results from our early studies was that perhaps the children were increasing their exposure to print when sending and receiving texts (e.g., see p. 156 of Plester et al., 2009) and that this situation led to the positive association between texting and reading performance. This argument was presented in the context of an apparent decline in the United Kingdom in schoolchildren reading for pleasure outside of school and the rise in mobile phone ownership and texting behavior in school-age populations. In Wood, Jackson, et al. (2011), we were able to examine directly this explanation. That is, in this study, we recruited 114 9- and 10-year-old children in the United Kingdom who did not own a mobile phone (these children were sampled from a range of different schools). The children within each school were then randomly allocated to one of two conditions: a control group (business as usual) and an intervention group that was provided with basic

mobile phones topped up with texting credits for use over weekends and during a weeklong half-term school break. Each week, we collected the phones from the children and transcribed each text message they had sent, and we also noted how many text messages each child had sent and received. These "traffic" data provided us with a direct measure of the additional exposure to print that each child was afforded by his/her mobile phone. When we considered these data in our analyses, we found that there was no evidence of an exposure to print contribution to the literacy outcomes of the children we studied. And yet, within the group of children who were given mobile phones (i.e., novice texters), we saw textism use that explain significant growth in spelling ability over time, even after controlling for individual differences in IQ, after just one term (10 weeks) of phone use.

This relationship between children's spelling development and their use of textisms was not an isolated finding. We also conducted a longer-term (September to July) longitudinal study of textism use and literacy outcomes in a cohort of 8- to 12-year-old children who were preexisting mobile phone users (Wood, Meachem, et al., 2011). In this study, we assessed the children at the beginning and end of an academic year on their reading, spelling, general cognitive ability, rapid naming, and phonological aware-ness. Like Plester et al. (2009), we found positive associations between use of textisms and concurrent reading and spelling scores. Of particular interest was the finding that the children's use of textisms at the start of the year could account for growth in their spelling ability over the academic year, even after controlling factors such as phonological awareness, verbal intelligence, and age. Moreover, we found that the nature of this relation-ship was unidirectional. That is, textism use at the beginning of the year could account for unique variance in spelling development over the course of the academic year, but reading and spelling scores at the beginning of the year could not account for growth in textism use over the academic year. Therefore, it could not be claimed that the observed relationships between textism use and literacy were attributable to the fact that it was the children with well-established literacy levels who were simply more proficient at textism use.

So, for some time now, we have speculated about the nature of the "value added" contribution of textism use to children's literacy skills. What we have learned from studies such as Wood, Jackson, et al. (2011) and Coe and Oakhill (2011) is that the contribution of textspeak to literacy develop-ment is specifically rooted in children's use of textisms rather than the frequency of texting behavior. Clearly, the contribution of textism use to

children's phonological development is part of this explanation; in Wood, Meachem, et al. (2011), we presented regression analyses that demonstrated this contention. However, the use of textisms seems to add something distinctive to children's literacy development. For example, in Plester et al. (2009), there was a positive concurrent association between reading and textism use that remained significant even after controlling for individual differences in age, short term memory, vocabulary, phonological awareness, and length of mobile phone ownership. In our earlier work, we suggested that engagement with textisms may motivate children to engage in playful exploration of language (Plester et al., 2009), which could be beneficial on a number of counts. It seems equally plausible to suggest that what textism-based literate activity affords children is an orthographic environment that is more "efficient" than conventional English orthography, and following Share's ideas, this may be promoting more effective literacy acquisition via the self-teaching mechanism.

SELF-TEACHING THEORY

In his (1995) paper, David Share outlined how orthographic representations were acquired through a process of self-teaching. He explained that although there were other potential routes to acquiring orthographic representations, phonological recoding was the most important because it enabled all readers (children and adults) to learn the orthographic representations needed for fluent word reading. Within self-teaching theory, it is proposed that the development of phonological recoding skill is achieved incrementally, item–by–item (as opposed to a stage-based progression), and is primarily applied to unfamiliar words, as the orthographic representations of high-frequency words are likely to be rapidly acquired:

> Because orthographic information is acquired rapidly... high frequency items are likely to be recognized visually with minimal phonological processing from the very earliest stages of reading acquisition. Novel, and less familiar items for which the child has yet to acquire orthographic representations will be more dependent on phonology.

> (Share, 1995, p. 155).

However, orthographic knowledge will increasingly constrain phonological recoding processes because as a child's lexicon grows, regularities in that language system will be identified and used to make phonological recoding more efficient:

> *The process of phonological recoding becomes increasingly "lexicalized" in the course of reading development. Simple letter-sound correspondences become modified in the light of lexical constraints imposed by a growing body of orthographic knowledge. The expanding print lexicon alerts the child to regularities beyond the level of simple one-to-one grapheme–phoneme correspondences, such as context-sensitive, positional and morphemic constraints. The outcome of this process of "lexicalization" is a skilled reader whose knowledge of the relationships between print and sound has evolved to a degree that makes it indistinguishable from a wholly lexical mechanism that maintains sublexical spelling-sound correspondence rules.*
>
> **(Share, 1995, p. 156).**

According to Share (1995), the acquisition of a small initial set of simple grapheme–phoneme correspondences may be sufficient.

INDIVIDUAL DIFFERENCES IN PHONOLOGICAL PROCESSING WILL IMPACT SELF-TEACHING

So from this account, for self-teaching to occur, two component processes are warranted—one phonological and one orthographic. Both make an independent contribution to literacy acquisition, but Share is careful to stress that it is the phonological recoding process that is dominant as research has shown that it can account for most of the variance in reading ability. The orthographic processing system is therefore seen as secondary. Moreover, there will be individual differences in an individual's ability to engage in phonological recoding and orthographic processing, and these individual differences will also impact the extent to which an individual draws on phonological or visual processing during self-teaching. Consistent with this idea, we can predict that in the context of text messaging, we should see evidence of reduced phonological engagement and increased reliance on more visual forms of text abbreviation in populations where phonological processing abilities are more compromised.

   This prediction is supported by the findings of Veater, Plester, and Wood (2010). In this study, children with developmental dyslexia were compared to reading age and chronological age–matched control groups on their use of textisms and their performance on measures of general ability and literacy–related skills. Veater et al. observed that the children with dyslexia were similar to controls in the overall proportion of text abbreviations that they used when texting, but the types of textism that they favored were different. In particular, they appeared to use fewer phonetic text abbreviations and more initialisms and symbolic forms. In line with this, we also observed that there

was no significant association between the dyslexic children's use of textisms and phonological skills, whereas such a relationship was observed for the children in the control groups. Veater et al. also found no association between textism use and reading ability in the group with dyslexia, whereas there was one for the control groups. Similarly, Durkin, Conti-Ramsden, and Walker (2011) compared the texting behaviors of 47 adolescents with Specific Language Impairment (SLI) to 47 age-matched controls who were typically developing readers. They observed that the teenagers with SLI were less likely to reply to text messages, and those who did reply, wrote shorter texts and use fewer textisms than the control group.

From Veater et al. (2010), we can see evidence of reduced use of phonetic text abbreviations compared to controls and no link between overall levels of textism use and literacy for the children with developmental dyslexia. In contrast, for the control children, there was an association between textism use and literacy skills. It should be recalled that the proportion of textisms used, although slightly lower in the dyslexic group, did not differ significantly from the textism levels observed in controls. Thus, where the textisms used afforded better opportunities for self-teaching to occur, given their phonetic transparency, we see a link between their use and reading attainment.

SELF-TEACHING THEORY AND SPELLING

Another reason to consider textism use as a beneficial route to self-teaching comes from Shahar-Yames and Share (2008), whose work demonstrated that learning to spell novel items is a more powerful route to self-teaching than reading. This is because during spelling acquisition the need for phonological recoding at the item level is unavoidable. Thus, we can predict that within our text messaging studies, we should see greater evidence of a link between textism use and spelling development than we do between textism use and reading. This is, in fact, what we do observe. Although in the Plester et al. (2009) study, there was a stronger relationship between reading and textism use than there was between spelling and textism use, it should be noted that the data in this study were concurrent whereby the text messages were elicited rather than spontaneously produced outside of the research setting. When we focus on the studies where we sampled actual messages sent by the children "in real life," we see significant but weaker relationships between textism use and reading compared to the relationships between textism use and spelling scores. Moreover, there was evidence that textism

use could explain variance in the development of spelling over time, which was not replicated for reading development (Wood, Meachem, et al., 2011; Wood, Jackson, et al., 2011).

A GOOD ENOUGH ORTHOGRAPHY

It is important to recognize that textspeak is not a perfect orthography: it is not perfectly transparent to read and spell once the code is unlocked. As noted, some textisms are not readily decodable through phonological recoding, and textisms are not used 100% of the time, or even most of the time, when textspeak is used. Semantic access is compromised if too many textisms are used relative to recognizable words. However, these features are permitted within self-teaching theory:

> *Too great a number of unfamiliar words will disrupt ongoing comprehension processes…but the occasional novel string will provide relatively unintrusive self-teaching opportunities.*
> *(Share, 1995, p. 158)*

Textisms that are frequently used are often very simplified phonetic spellings, which may be unconventional spellings in the sense of not being the accepted forms, but they usually do conform to the underlying orthographic rules of English in terms of legal letter combinations and positions. In this sense, a word like "nite" is acceptable as it follows the same pattern as "site," and "wot" is orthographically acceptable just as "hot" and "got" are. Clearly these spellings are oversimplifications, but they do offer children the ability to communicate before they may have grasped more unfamiliar or complex orthographic forms such as "–ight" or "wh–" and may also be observed in children's early attempts at spelling in formal school work. Rather than representing a threat to children's literacy development, it would seem that such spellings provide an entry point to a more complete conventional orthography by permitting the learning of an initial set of orthographic representations which kick start the self-teaching process.

> *… there is a considerable volume of reading and spelling data indicating that an initially incomplete and oversimplified representation of the English spelling-sound system becomes modified and refined in the light of print experience.*
> *(Share, 1995, p. 165)*

Although print experience in textspeak will expose children to an increased number of simplified spellings than they would usually see in print, they will be interacting with other children and adults whose responses in textspeak

may include the conventional spellings of these items, and it is important to acknowledge that children are not entirely dependent upon digital texts for exposure to conventional orthographic forms.

If we accept textspeak as a recently developed example of an efficient orthography (or at least a more efficient orthography than Standard English), we also can consider its utility in the context of reading instruction. Children's familiarity with textisms affords teachers a new context in which to explore their students' understanding of phonic principles with real world validity. For example, the use of nonwords in the United Kingdom nationally implemented reading test for 6-year-olds has been viewed controversially by primary school teachers because children at such an early stage of reading instruction may be confused by being asked to "read" words which have no semantic content. Phonetically based textisms, however, in this age group, have the orthographic properties of nonwords but could be employed in the context of lessons to introduce students to the idea of alternative (nonconventional spellings), as in "these words are used as a quick and friendly way of writing when we are talking to our friend on the computer or on our phones." They could also be potentially used to reinforce phonics-based instruction for children who perhaps need more extended exposure to simplified orthographic forms. This exposure would permit a wider range of semantic content to be accessed for the purposes of storytelling as in the case of reading books in which textisms are used as a story device for characters to interact with each other, thereby permitting older readers who experience reading delays to read more age appropriate content in a simplified orthographic environment. Experimental evidence from Dixon and Kaminska (2007) has shown that we do not need to be anxious about encouraging children who are in the acquisition phase of reading development to read alternative spellings as they do not undermine their memories for the conventional "correct" forms of those words (although it should be noted that the same is not true for adults who have consolidated understanding of conventional word spellings).

Textism use is, of course, not something that should replace conventional reading instruction, which we are not suggesting here. But what we can say is that it can support children's literacy development by providing a "real" linguistic environment that children engage with outside of the classroom on a frequent basis. It is also the one that could be employed and manipulated if necessary to guide children to successful phonological recoding skills and full orthographic representation of English where increased exposure to a more simplified set of orthographic conventions

is needed to establish phonological recoding processes. Care would need to be exercised in relation to students whose phonological processing abilities are limited, as in the case of dyslexia, but the potential is there.

WIDER TEXTING BEHAVIORS AND ACADEMIC PERFORMANCE

The use of digital technologies by young people has also raised concern in terms of its potential impact on wider academic skills and behaviors. For example, there have been a number of negative reports of its impact, with excessive texting (i.e., texting frequency rather than textism use) being linked to poor academic performance and ultimately students falling behind on schoolwork (Espinoza & Juvonen, 2011). It would appear that for schools ownership of mobile phones by their pupils has proven a difficult transition to navigate. That is, schools want to integrate these technologies into the curriculum, but they can be viewed as disruptive to quality teaching and learning. Purcell et al. (2012), in a survey of high school teachers, found that the majority of parents and teachers believed that young people were now more easily distracted than previous cohorts of students had been, and that they also had shorter attention spans. Similarly, technologies such as text messaging are seen as a distraction to students, rather than a resource with the potential to support learning. However, arguably, such distractions are now an inevitable part of modern-day life and should be seen as something to be managed successfully rather than a problem to be overcome.

One suggestion as to why young people's general academic attainment may be adversely affected by the use of personal digital technology is the compulsion to multitask. The rise of technology has made multitasking the norm. How often do we, as adults, sit on the sofa in the evening "watching" television while at the same time checking our phones for a text message or browsing the Internet on a tablet or computer? It has been suggested that such multitasking (transference between activities) can not only lead to an inevitable increase in the amount of time it takes to complete tasks and more errors but also more "shallow thinking" in place of deeper, more reflective cognitive activity (Carr, 2010). It has been suggested that the desire to multitask is driven by the emotional rewards gained through reading the text messages even if this is at the cost of learning (Wang & Tchernev, 2012).

It is however important to consider whether, as we have seen before, these anecdotal accounts about the impact of text messaging are actually

correct. In one study, Rosen, Lim, Carrier, and Cheever (2011) sent college students none, four, or eight text messages during a lecture. The results were perhaps surprising in that the students who received the most text messages only performed 11% worse than the group of students who received no texts. The group who received four text messages did not do any worse than the group that received no texts. However, Rosen also found that during 15-min observation periods, participants were only able to maintain on-task behavior for a short time (approximately 6 min). Those who received text messages more often were more easily distracted from their primary task activity. Rosen, Carrier, and Cheever (2010) suggest that young people should be allowed to multitask particularly when the task demands of the secondary task are low or when the tasks require different sensory modalities.

Rosen, Cheever, and Carrier (2012) have further argued that rather than banning the use of mobile phones, schools could consider a policy of providing "technology breaks." Young people would be permitted to check their phones before a lesson started and place them on their desks on silent upside down so that they were in sight. This, it is argued, would prevent young people from being interrupted but would provide a stimulus to remind them that they will be able to check their phones on their next technology break. It was found this method boosted attention and focus and enhanced learning.

CONCLUDING REMARKS

Overall, the world of the young person has changed; the extent of their online behaviors outside school does have an impact on their educational performance, and these impacts can be positive. We need to mobilize this environment to support young people through the teaching of new skills and the development of new rules. It is suggested that young people need to be taught metacognitive strategies regarding how best to exploit and manage their use of technology in the context of learning to mitigate its more negative effects (Rosen et al., 2011).

As we have noted elsewhere (Wood, 2017), the nature of children's literacy experiences and practices are fundamentally changing (if not already changed) as a result of the digital mediation of childhood and of information in society. Textspeak has its own currency and utility for young people and is arguably providing them with a linguistic environment in which their written language acquisition is supported and facilitated rather than damaged

and diminished. The ideas from self-teaching theory enable us to contextualize the learning process of children engaging with textisms outside of school and to understand the reasons as to why the use of such alternative forms do not represent a threat to conventional learning, instruction, or development. Furthermore, there is scope to use textisms in experimental work to examine the ideas behind self-teaching theory and even to test the ideas put forward here regarding the efficiency of textspeak. For example, it would be a simple matter to construct an experiment in which reading speed and comprehension are assessed in the context of a standard English passage containing some unfamiliar word tokens compared to the same passage with the unfamiliar words replaced by textism versions (phonetic in one condition, visual/symbolic in another, if further comparison is desired). The participants' memory for the spelling and meaning of the novel items could be compared across conditions as a further examination of self-teaching principles.

Use of digitally mediated texts by children and young people is on the increase and the nature of literacy is changing in many ways, but the fundamentals of learning to read and spell remain. The issue is that, for many practitioners, digitally mediated literacy is seen to have a lower value than conventional literacy practice, and as a result its affordances are overlooked. In this chapter, we hope that we have shown that even the most "problematic" forms of digital text exposure have a potential positive function that can be understood in very conventional terms, and as with all resources and technology, it is through understanding their application that we can mobilize them to achieve the greatest benefits.

ACKNOWLEDGMENTS

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