Critical Review: Does text messaging lead to better literacy outcomes in adolescents?

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This critical review examines the most recent evidence on the relationship between text messaging and literacy skills in adolescents. An electronic database search yielded six articles that met inclusion criteria: two between groups nonrandomized clinical trial designs, one mixed randomized clinical trial design, one within group repeated measure design, and two single group post-test designs. Overall, findings indicate suggestive evidence of a positive relationship between text messaging and literacy skills in adolescents. The clinical implications and limitations of the research are discussed, along with future recommendations.

Introduction

Text messaging is a common form of communication that not only adults have adapted to, but it is also becoming more common among children and adolescents (Coe & Oakhill, 2011). When mobile phones were initially used for text messaging and the technology was not as advanced as it is today, there was a character limit for the size of text message you could send. This resulted in people heavily abbreviating words to fit within the 160 character limit (Thurlow, 2003). Overtime this became a linguistic trend that continues to be used in text messaging today regardless of no character limit. These abbreviations, otherwise known as textisms, are often phonological forms of spelling that are non-conventional (Plester et al., 2009). Due to the amount of texting, along with the use of textisms occurring within the younger generations, there have been concerns raised regarding the impact it may be having on literacy skills (Coe & Oakhill, 2011). The media is a large contributor to proposing this negative effect however, the speculation and concern raised in the media is not supported by empirical evidence (Thurlow, 2003). Studies indicate that children as young as 5 years of age are becoming owners of mobile phones, with the majority of adolescents ages 8-15 owning a mobile phone (Plester et al., 2009; Wood et al., 2011). Therefore, the negative effects on literacy that are reported in the media has also become an increasing concern among parents and teachers because children's literacy skills are still developing at this young age.

Contrary to media reports (Thurlow, 2006), the use of text messaging is in fact increasing children's exposure to print which may prove to be a benefit to literacy development (Coe & Oakhill, 2011). Text messaging is also increasing phonological awareness skills through the use of abbreviations, which has a positive impact on reading and spelling ability (Plester et al., 2009). Therefore, suggesting a positive relationship between texting and literacy skills.

Although recent research surrounding this topic is limited, it is important to consider the research that does exist to display evidence rather than rely on media claims. The research that does exist surrounding this topic is important for Speech Language Pathologists (SLPs) to consider because parents and teachers may raise concerns to SLPs while working with children who have delays in literacy development. Therefore, this review aims to display the existing literature to determine if literacy is positively impacted by text messaging.

Objectives

The primary objective of this paper is to critically review existing literature to determine whether text messaging and the use of textisms leads to better literacy outcomes in adolescents. The secondary objective is to propose clinical implications of this research.

Methods

Search Strategy

Relevant journal articles were found using online databases including PubMed, Western and Affiliate Libraries + OMNI Libraries, and Google Scholar. The following search terms were used: ("texting" OR "text messaging" AND "literacy" AND "skills" OR "development" AND "children" OR "adolescents"). The search was limited to articles written in English.

Selection Criteria

Studies selected for inclusion in this critical review were required to measure some aspect of literacy skills/development (e.g., reading, writing, spelling, phonological awareness), as well as text messaging behaviours, or the use of textisms. The studies were also

required to include participants in the adolescent age range.

Data Collection

Results from the literature search yielded six articles that met selection criteria. The articles included two between groups nonrandomized clinical trial design (Level 2a), one mixed randomized clinical trial design (Level 1), one within group repeated measure longitudinal design (Level 2b), and two single group post-test design (Level 3). These levels of evidence were determined based on the experimental design decision tree (Archibald, 2009). The numbered levels are assigned based on a scale in which a lower number (e.g., Level 1) is indicative of a stronger study design that provides greater evidence to the question being researched. A higher number (e.g., Level 3) can still be attributed to a well-designed study however, the design itself is not as strong compared to those lower on the scale. These levels of evidence are used to contribute to the overall evaluation of the study.

Results

Between-Groups Nonrandomized Design

A between groups nonrandomized design is one in which participants in these studies were allocated to different groups based on predetermined criteria, therefore, they were not randomly assigned to a group. Nonrandomized designs allow for correlational relationships between group membership and a particular skill to be determined.

Coe & Oakhill (2011) performed a nonrandomized study design to compare good readers and poor readers on frequency of text messaging, type and number of textisms used, and reading speed of text language versus standard English. The study consisted of 10-11 year old students (n=41) from two classes at a primary school in Brighton England. The children were divided into two groups (24 good readers and 17 average/poor readers) based on their performance on the reading subtest of the national curriculum English assessments. All participants completed a questionnaire about their phone ownership and frequency of usage. To determine type and number of textisms used, each participant wrote a text message on a piece of paper and they also rewrote 16 English words as they typically would while sending a text message. Only 22 participants completed the orthographic decoding task where text messages written in both English and text language were presented to the child and the time it took them to read each message was recorded.

Results showed that the poor reader group had access to a mobile phone at an earlier age, and they also reported spending more time using their phones compared to the good readers. Poor readers used significantly fewer textisms when writing a text message and there was a non-significant difference between the two groups on the translation task (English words to textisms). Results from the reading task showed that overall, messages in English were read faster than messages in text language. The good readers read all messages faster than the poor readers however, there was no significant effect of owning a phone on reading speed.

Coe & Oakhill (2011) provided detailed descriptions of the tasks administered in the study. The study design is appropriate for the author's clinical questions however, there are some limitations. Since results from the questionnaire indicated 16 participants did not own a cell phone, some of these children may not have experience with texting which would impact the results found during the reading and writing tasks related to text language. It should also be noted that writing a text message is not a naturalistic measure of texting which could have an effect on the text language the participants used during the task. Coe & Oakhill (2011) also acknowledged some limitations of the study. There was a small number of participants which limits the conclusions that can be made. Estimates provided by the children on the questionnaire may not be accurate representations of their texting experience and phone usage. It is important to note that the order in which children read the messages during the timed reading task was counterbalanced, accounting for order effects. Overall, this study provides equivocal evidence for the use and knowledge of textisms being positively linked to reading abilities. Because the poorer readers used their phones more often and were less likely to use textisms, results do not fully suggest a positive association between text messaging and literacy skills.

Kemp & Bushnell (2011) aimed to determine if text messaging method and experience has an effect on children's textism use and understanding. They also aimed to examine if the use of text-message abbreviations has a negative effect on children's conventional literacy skills. This review will focus on the latter purpose. 86 children aged 10-12 years from three middle class Australian schools were divided into three groups based on their typical text entry method (45 predictive text users, 12 multi-press users, and 12 non-texters). All participants completed the same assessment tasks and results were compared between groups. Spelling, real-word, and non-word reading skills were assessed using standardized literacy assessments. To measure textism use and knowledge, participants read aloud two text messages (one written in conventional English and one written in textese). They were also asked to type two dictated messages (one in

conventional English and one in textese) into a mobile phone that was provided.

Results showed that the non-texter group scored slightly higher on all three literacy tasks however, appropriate statistical analyses confirmed that the group differences were not significant on any of the literacy measures. Pearson's product-moment correlations were conducted to report any relationships between mobile phone tasks and literacy skills. It was found that greater accuracy with reading textese messages and faster reading of conventional and textese messages was significantly and positively correlated with all three literacy scores. A significant and positive correlation was also found between faster time to compose both messages (conventional and textese) and spelling and real-word reading tasks. Therefore, experience with textisms and skill in deciphering them is related to better literacy skills.

Although the number of participants included was not large, the inclusion of a non-texter control group provides greater validity to the results found. The schools that the participants were recruited from were SES matched, which helps to limit differences based on access to mobile phones. It was reported that order effects were accounted for as the standardized literacy tasks and the mobile phone tasks were administered in counterbalanced order. Based on the study design, inclusion of a control group, and assessment methods, this study provides strongly suggestive evidence for a positive relationship between texting and literacy skills.

Mixed Randomized Design

Participants in a RCT are randomly assigned to the experimental group or the control group. RCTs can address cause-and-effect relationships.

Wood & Jackson et al. (2011) completed a mixed randomized design study to investigate if children who have access to mobile phones display improvement in literacy performance compared to children who do not have access to mobile phones. They also aimed to determine if the use of textisms improves literacy performance. 114 children aged 9-10 years who had never owned a mobile phone were randomly allocated to the intervention group (n=56) or the control group (n=58). The participants were recruited from 12 schools in the Midlands region of the UK. All participants were assessed on general IQ, reading, spelling, and phonological awareness using standardized assessments. Following the initial assessment, the intervention group received a mobile phone that they were given full access to on weekends and for one full week during their half-term break. The control group did not receive access to a mobile phone. All participants were assessed weekly on their reading and spelling to monitor progress and to ensure no adverse effects of mobile phone use were noticed. To collect data on text messages, the research team transcribed all text messages sent by each participant. Following the 10-week intervention period, the reading, spelling, and phonological awareness assessments were re-administered to all participants.

Appropriate statistical analyses revealed that both groups were comparable on the pre-test measures and little difference was seen between the groups on post-test improvement. There was some evidence of significant association between the number of messages sent at the end of the study and improvement in phonological awareness skills. The average textism use was significantly associated with most literacy skills pre- and post-test and textism use was found to predict a significant amount of variance in spelling development during intervention. Although children in the intervention group did not perform differently from the control group in terms of literacy development, their literacy development was not negatively affected by mobile phone use.

Strengths of this study include a fair number of participants from a range of schools, the inclusion of a control group and random group allocation. A limitation of this study noted by Wood et al. (2011) is that practice effects could be possible due to the participants completing the same assessments weekly. However, they reported that feedback was not provided and there was little evidence of significant practice effects. Based on a strong study design, appropriate statistical analyses, and the limitation, this study provides suggestive evidence for the use of textisms being positively related to improvement in spelling. The evidence more strongly suggests that text messaging does not adversely affect literacy skill development.

Within-Group Repeated Measure Design

A within-group repeated measure design is good for displaying performance trends over time and variability between participants is reduced because the participants act as their own control. To reduce practice effects, randomization of tasks needs to be employed.

Wood & Meachem et al. (2011) explored the nature and direction of associations between children's use of textisms and performance on literacy tasks. The participants consisted of children ages 8-12 years from primary and secondary schools in the West Midlands, UK (n=119). All participants either owned their own mobile phone or had regular access to one. Verbal IQ, reading, spelling, phonological awareness, and phonological retrieval skills were all assessed using standardized measures. The assessments were

completed at the beginning of a school year and then again at the end of the academic year. To investigate texting behaviour, the children provided text messages sent over a weekend at both the beginning and end of the school year. The text messages were coded for textism type and textism-to-real-word ratio.

Correlational analyses between textism ratio and literacy skills revealed that textism use at the beginning of the year was significantly related to both spelling and reading ability at the beginning and end of the academic year. It was reported that improvement was observed on all literacy measures over the academic year. When controlling for age, verbal IQ, and phonological awareness, regression analyses displayed that textism use was unable to predict reading ability however, textism use was able to predict significant variance in spelling ability. This was found to be a unidirectional relationship as reading and spelling ability were unable to predict growth in textism use.

Wood et al. (2011) completed accurate statistical analyses to display the nature and direction of the relationship between literacy skills and textism use over time. It was reported that word reading and spelling subtests had internal reliability of .963 and .957 respectively and the phonological awareness measure had internal reliability of .868. This indicates excellent and good internal reliability of the measurements. Methods were appropriate for their purpose and aimed to fill gaps in previous research. One limitation noted is the inability to complete regression analyses between each age group due to the small sample size. This study provides highly suggestive evidence that textism use has a positive effect on spelling ability in adolescents rather than detrimental effects due to strong internal reliability, along with valid assessment measures and statistical manipulations.

Single-Group Post-test Design

A single-group post-test design is not considered as strong as other designs because there is no comparison measure or group. Single group studies are appropriate for displaying correlational relationships between variables.

Plester et al. (2008) completed and reported on two studies in which the purpose of the first study was to determine if high and low text users displayed differences in academic outcomes. The second study aimed to determine the relationship between textism use and adolescent performance on spelling and writing tasks. This review will focus on the second study as it relates specifically to literacy and the purpose of this review. Children ages 10-11 years from two schools in England participated in the study (n=35). The participants completed a short questionnaire about mobile phone use. Spelling ability was assessed using the spelling sub-test of the British Ability Scales II, and the schools provided information on the children's writing ability based on their KS2 national curriculum English assessment. To measure textism use, the participants translated a text message containing textisms into standard English and they also translated a standard English message into text language. The ratio of textisms to real words was measured and textisms were coded into categories.

Appropriate analysis revealed a significant positive correlation between textism to real-word ratio and spelling ability. The use of phonological abbreviations (e.g., nite, wuz) and 'youth code' (e.g., wanna, gonna) textisms was significantly related to spelling ability. When analyzing writing ability and textism use, it was found that those with higher writing scores made significantly less errors when interpreting text to English in the translation task. Participants with higher writing scores also used a greater number of phonological textisms and acronyms, along with an overall greater textism to real words ratio in the English-text translation task.

The design of this study presents a limitation due to the fact that there is no comparison measure or control group however, it allowed correlational relationships to be determined. Another limitation noted is the small sample size as this limits the generalization between this small population. Plester et al. (2008) determined there were no differences between boys and girls on the measures, and only one small difference was noted between 10-11-year-olds, therefore it was appropriate to combine all participants into one group for analysis. With these limitations and the assessment measures in mind, this study provides somewhat suggestive evidence of a positive relationship between adolescent literacy performance and engagement with text language.

Plester et al. (2009) aimed to investigate two main research questions. The first question was concerned with the extent that any association between literacy skills and knowledge of textisms is mediated by other factors (ie., phonological awareness, cognitive factors, age, or length of exposure to texting). The secondary research question explored how use of specific textism forms was associated with literacy skills. 88 participants ages 10-12 years were recruited from five schools in the Midlands, UK. All participants completed a questionnaire regarding demographic information, and mobile phone use. All participants were then individually tested over three 20-minute sessions on the following skills using standardized measures: receptive

vocabulary, verbal working memory capacity, conventional reading and spelling, alphabetic decoding, and phonological awareness. To measure textism to total words ratio and to categorize textism type, the participants were given 10 scenarios and had to write a text message they would hypothetically send in each situation.

The ratio of textisms to total words was positively correlated to word reading, vocabulary, and phonological awareness. After controlling for differences in age, short-term memory, vocabulary, phonological awareness, and length of mobile phone ownership, textism use was found to predict word reading ability. It was also reported that there seemed to be greater significant relationships between word reading and type of textisms compared to spelling and type of textisms. The strongest relationships were seen between phonologically based textisms (homophones and accent stylizations) and word reading ability.

Appropriate statistical analysis was completed to report on the main research questions. The order in which the tasks were administered was randomized in order to minimize order effects. The schools in which participants were recruited from represented a wide range of socio-economic urban and suburban areas which allows for greater generalization of results however, the participant sample is still fairly small to make significant generalization reports. Plester et al. (2009) acknowledged that the elicitation of text messages was not naturalistic and was a limitation in the assessment of textism use. They also reported that the participants were aware of the topic of investigation which may have influenced their use of textisms in the task however, it was observed that the textism to total word ratio was less compared to previous studies. Therefore, it is unlikely that participants overused textisms as a result of knowing their text messaging behaviour was being investigated. Based on these strengths and limitations, this study provides suggestive evidence that text literacy is positively associated with standard literacy skills.

Discussion

This critical review revealed mixed results and, therefore, caution should be taken when making conclusions and reporting on clinical implications while considering the limitations in the research. This review analyzed six studies to determine if text messaging leads to better literacy outcomes in adolescents. Overall, results indicate suggestive evidence for a positive relationship between the use of textisms in text messages and literacy skills. Although studies showed mixed results for the aspects of literacy that are positively related to textism use, all of the studies displayed compelling evidence and conclusions that adolescent literacy skills are not negatively affected by text messaging.

Limitations in the designs and methodologies make it difficult to generalize the findings. Only two of the six studies included a control group (non-texters), and only one study completed a randomized control trial where participants were assessed pre- and post-intervention. Therefore, this weakens the strength of the findings. Although researchers tried to make the situations for testing textism use as natural as possible, only three of the studies actually measured textism use through the use of a real mobile phone. The use of pen and paper for writing text messages in the other three studies also weakens the strength of this measurement. Another limitation is that all of the studies, except one, were conducted in the same geographical location (Midlands, UK). Therefore, the small sample sizes of participants, along with the homogeneity of geographical location limit the generalizability of results.

Despite the presence of limitations in the research, all six studies reported at least some relationship between textism use and literacy skills. Positive relationships were found between textism use and spelling, reading, writing, and phonological awareness (Kemp & Bushnell, 2011; Wood & Jackson et al., 2011; Wood & Meachem et al., 2011; Plester et al., 2008; Plester et al., 2009). These relationships do not come by surprise because the use of textisms can help to solidify adolescent phoneme-grapheme understanding as texting allows them the freedom to play with words in a way that is enjoyable to them. The adolescents also indicated their awareness of when it is appropriate to use text language and their ability to easily switch between text language and standard English in appropriate contexts (Coe & Oakhill, 2011; Plester et al., 2008; Plester et al., 2009). Therefore, parents and teachers do not have to be concerned about texting negatively influencing adolescent standard English literacy in the classroom setting.

This review contributes to the body of literature by providing an overview of the existing research regarding the relationship between text messaging and literacy skills in adolescents. By providing a critical analysis of each study, this review better informs readers on the strength of evidence, along with the importance of the results communicated.

Clinical Implications

Speech Language Pathologists can confidently assure concerned parents and teachers that text messaging does

not have adverse effects on literacy skill development in adolescents. They can inform them that evidence suggests that any relationships that have been found are positive. Further research is still warranted to display compelling evidence for text messaging leading to better literacy outcomes in adolescents.

It is important to present this information to parents or teachers in a way that uses gentle language and is not suggestive of increased screen time or increased cell phone use. The information can be presented in a way that highlights no detrimental effects are seen between texting and literacy development, however, it is important that children and adolescents are continuing to practice and develop their literacy skills through physical book reading and writing.

Conclusion

Overall, the literature reviewed suggests a positive relationship between textism use in text messaging and literacy skills however, it more confidently highlights that there are no adverse effects of texting on literacy skills. Future research can build on the existing literature by completing more longitudinal studies, along with more randomized control trials where there is an intervention group and a control group. It is also suggested to complete studies in a variety of geographical locations with larger participant groups to allow for greater generalization of results.

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