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Rhyming versus Repetition in Children's Stories: The Role of Reading Strategies in New Word Recognition

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RHYMING VERSUS REPETITION IN CHILDREN'S STORIES: THE ROLE OF READING STRATEGIES IN NEW WORD RECOGNITION

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Abstract

There is a lack of research that focuses on how the structure of children's storybooks contributes to reading development. Although many parenting sites express the benefits of reading rhyming stories to one's children, there is a lack of empirical research to support this claim. The goal of the present study was to determine whether exposure to rime or repetition strategies would enhance children's ability to correctly pronounce novel words and non-words. In this study, the clue word paradigm created by Goswami (1988) was used to determine if children could more successfully use the orthographic analogy strategy in a story context, following exposure to a rime or repetition training paradigm. The results of this study indicate that the participants tested did not utilize the orthographic analogy strategy described by Goswami (1988), regardless of whether they were in the rime or repetition condition. Potential explanations for these findings are discussed, as well as the possible limitations of this study and areas for future research.

Keywords: emergent literacy, orthography, reading development, orthographic analogy

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Introduction

It is established in the emergent literacy literature that phonological awareness is one of the skills that predicts later reading ability (e.g., Anvari, Trainor, Woodside, & Levy, 2002; Zucker, Cabell, Justice, Pentimonti, & Kaderavek, 2013; Corriveau, Goswami, & Thomson, 2010). Phonological awareness is the ability to recognize and manipulate the phonological segments of spoken words (Corriveau, Goswami, & Thomson, 2010). Skill in this area appears to assist children in learning to read by helping them understand how written symbols map onto the component sounds of words (Durgunoğlu & Öney-Kusefoğlu, 2002). Children who are able to discriminate individual sound categories in a word are better able to associate the phonemes with their orthographic representation (Anvari, Trainor, Woodside, & Levy, 2002). Related skills such as segmentation and blending also appear to be good predictors of reading success (Tsang & Conrad, 2011) and measures of rhyming ability and syllable and phoneme deletion tasks are commonly used to detect children at risk of reading problems (Levy, Gong, Hessels, Evans, & Jared, 2006).

Prior studies on early literacy development have focused on how shared reading, (i.e., the interactions and discussions that occur when children and adults look at a book together) impact children's reading skills (e.g., Zucker, Cabell, Justice, Pentimonti, & Kaderavek, 2013; Simcock & DeLoache, 2006). One recent meta-analysis provided evidence demonstrating that interactive shared-reading experiences have moderate positive effects on a child's oral language, vocabulary skills, and print knowledge (Zucker et al., 2013). Other researchers have found evidence to support the hypothesis that shared reading affects the acquisition of written language by allowing

children to internalize the written language register (Bus, van Ijzendoorn, & Pellegrini, 1995). In addition, Bus et al. (1995) found that the frequency of parent-child book reading interactions did have an effect on reading acquisition, even for low socio-economic families that may have few other incentives to become literate. Furthermore, Bus et al. suggested that their results support the development of family literacy programs that stimulate parent-child reading interactions.

Other research has looked at the impact of specific extratextual behaviours, which are behaviours by the person reading the story to the child that are separate from the reading of the story. Extratextual behaviours can include using picture books as teaching events by pointing and labeling pictures, asking questions, providing feedback, and elaborating on story lines (Simcock & DeLoache, 2006). Pointing and labeling pictures in children's stories is referred to as *labeling behaviour*, and has been shown to facilitate word learning and vocabulary expansion (Fletcher & Reese, 2005). Zucker et al. (2013) demonstrated in their study on shared-reading interactions that these extra behaviours during reading correlate with the most improvement in children's vocabulary skills, especially when adults provide rich vocabulary instruction that includes child-friendly definitions. Other studies have suggested that the social interaction in storybook reading allows for the parent to scaffold the introduction of new words by using the pictures as clarifying referents, also further increasing vocabulary (Fletcher & Reese, 2005). Shared reading can be viewed as a triangular interaction between the child, the adult reader, and the storybook (Read, 2014). An experimental study conducted by Whitehurst et al. (1988) compared the expressive language abilities of children following a one-month training intervention. The parents in the control group were instructed to read to their child in their customary fashion, while the experimental group received instructions to increase their extratextual behaviours when reading

to their child. The results demonstrated that children who were regularly engaged in story reading with adults characterized by a more dialogic reading style, which included open-ended questions, elaborations and repetitions, showed more positive increases in vocabulary growth, including higher scores on post-test observations (i.e., Peabody Picture Vocabulary Test, Expressive One Word Picture Vocabulary Test) (Whitehurst et al., 1988).

Conversely, there has been less research focused on how the structural content of the stories (i.e., word choices, rhythmic patterns in the text) are utilized to further reading development. A common characteristic of children's stories is the use of rhyme. In one survey of 160 parents with two- to four-year-old children, rhyming books made up 38% of their home libraries (Read, 2014). Knowledge about and experience with nursery rhymes has been positively associated with phonological measures such as the ability to produce and detect rhyming patterns, as well as with pre-literacy measures, such as alphabet knowledge and letter-sound awareness (Dunst, 2011). Children's familiarity with common nursery rhymes such as *Jack and Jill* and *Hickory Dickory Dock* appear to translate into better rhyme production and rhyme detection abilities (Dunst, 2011). Rhyming skills, like rhyme production and rhyme detection, rely on the ability to categorize words based on similar sounds. Syllables contain an *onset*, which is the initial consonant of a word, and a *rime*, the following vowel and any consonants thereafter (Booth & Perfetti, 2002). Onset-rime awareness is thought to play a role in how children initially begin relating print to sound, and contributes to the ability of pre-readers to recognize rhyming words and to create rhymes (Ratchford, 2005). Children as young as 4 years of age can demonstrate an awareness of rhyme and alliteration, which is not surprising considering what a large part rhyming plays in young children's lives (Goswami & Bryant, 1992). Goswami and Bryant (1992) believed that experience with rhyme and alliteration could help children form

orthographic categories that mapped onto the rhyming categories they had already formed. Analogies are reading development strategies that require the individual to categorize the word based on its spelling pattern and to recognize the pattern of that word in another word, in order to correctly read the new word. It has been suggested that an early understanding of rhyme may lead to the ability to use analogies to understand words with similar rime spelling patterns (Goswami, 1988). It has been demonstrated that children (readers and non-readers) can successfully use analogies to read new words by using the rime pattern at the end of the words (Goswami, 1988). The significantly stronger effect for analogies between the ends of words supports the theory that the use of analogies in reading is closely related to rhyming (Goswami & Bryant, 1992). In addition, other research suggests that the frequency with which readers encounter identical rimes contributes to word recognition abilities (Calhoon, 2001).

Repetition has been widely studied in the memory and cognition literature, and repetition has been found to improve retention of information, making it a widely used learning strategy (Hargis, Terhaar-Yonkers, Williams, & Reed, 1988). According to Hargis and colleagues (1988), in the process of reading, repetition is used to place new words into short-term memory and then into long-term memory. Research into repetition in children's stories has focused on how repeated reading of the same stories can facilitate word learning (Horst, 2013). One study demonstrated that children learned more novel words through shared storybook reading when the same three stories were read repeatedly than when nine different stories were read (Horst, 2013). Horst (2013) described this as an effect of contextual repetition – when children encounter the novel words in the familiar context versus a new context during repeated trials, it is less difficult for them to retain the name-object association for the new word because they have less novel information to process in the repeated story condition. It has also been shown that children are

able to remember more words if the learning occurs in the form of a repeated story instead of a single longer story. One potential explanation for this is that the repetition of a story helps draw the child's attention to smaller details such as new words, as other aspects of the story like the plot are more familiar on repeated readings (Horst, 2013). Researchers in the field of early reading development have proposed that the repetition of individual lexical items in stories might be useful because when children encounter the same word several times, it is likely to help them remember the word long-term (Darnton, 2001).

It seems to be a common practice for most modern children's books to combine rhymes with repetition in order to provide a beneficial learning experience for beginning readers (e.g., Dr. Seuss stories). Yet it is unclear which basic strategy – rime or repetition – is most helpful for young readers in developing word recognition. Previous research has focused on the relationship between rhyming ability and later reading development, and has specifically demonstrated that early rhyming skills and rhyme awareness can predict later reading progress (Goswami & Bryant, 1992; Wood & Farrington-Flint, 2002). A few intervention studies have attempted to demonstrate that training in rime distinctions can improve reading ability; however, many of these studies lacked statistical significance and failed to demonstrate improvement in participants' reading abilities (Goswami & Bryant, 1992*).* Conversely, it has been found that even very young children can make analogies when trying to read new words, and that analogies can be made between spelling patterns in words even by children not yet formally reading (Goswami & Bryant, 1992). From the previous research it is clear that there are questions to be explored regarding the actual structure of children's stories, including word choice and patterns in the text, and how structure assists in reading development. Rime and repetition are frequently used in children's books, and there is a good deal of anecdotal evidence that supports the use of

these strategies in stories. However, it is unclear empirically whether text strategies such as the use of rhyme or repetition actually facilitate word recognition in young children.

In sum, the style of modern children's stories seems to utilize common characteristics, such as rhyming words and frequent repetition, suggesting that these explicit emergent literacy techniques/strategies may have real-world significance in reading development. However, to our knowledge, there is no research that unambiguously examines the role of story composition and structure in emergent literacy, using an experimental design. The goal of the present study was to compare the use of rhyming to the use of repetition in children's stories to determine which reading strategy is more effective in facilitating new-word reading. One condition consisted of exposing the child to a number of rime analogies (i.e., socks, blocks, rocks), while the other condition used repetition to enforce a single word with a clear onset-rime pattern (i.e., hearing 'socks' fifteen times). At test, we attempted to establish whether rime or repetition training leads to better usage of orthographic analogies with new rime-analogous words.

Pilot Study 1A

Participants

The participants in this study were children who attended the Dr. Mary J. Wright University Laboratory School (referred to as the Lab School). In this study, children from the Kindergarten and Preschool classes were asked to participate. Eighteen parents gave permission for their child to participate in research. Ten children were tested in this phase of the study, with a mean age of 3 years, 7.5 months, and a range of 3 years, 3 months to 4 years, 4 months at time of testing. The Lab School Director identified the students who would be appropriate candidates to participate in this study. These students were considered 'pre-readers' and in the early stages of learning to read. Eight children who had returned their consent forms were not tested in this

pilot because previously tested participants of the same age (approximately 3-years-old) demonstrated an inability to understand the task.

Materials

Participants were first tested on two subscales of the Woodcock Reading Mastery Test – Revised edition (Woodcock, 1998) to assess their baseline reading ability. Specifically, the Word Identification task, which requires reading words of increasing difficulty, and the Word Attack task, which tests decoding ability for non-words of increasing difficulty, were used. The Woodcock Reading Mastery Test is a commonly used assessment of reading readiness that is appropriate for use with children from Kindergarten to Grade 12. The test is considered to have a wide range of normative sample data from 6,089 subjects in 60 geographically diverse U.S. communities and good reliability; additional psychometric data for the Woodcock Reading Mastery Test is available from the test constructor (Woodcock, 1998). Two stories were used in the study. Story One was adapted from Goswami (1988) and the researcher wrote Story Two, with a similar structure to Story One (see Appendix I). Story One and Two were similar in structure and format, but used different target words. Each story had a rime version and repetition version. In the rime condition, participants were exposed to a word and nine rime analogies. In the repetition condition, the participants were exposed to the target word nine times throughout the story. The target words in the story were visibly different from the rest of the story text to make the target words highly salient (e.g., bolded text). A new-word recognition test was also used in this study. The novel test words were presented one at a time on individual cue cards. The test words consisted of real words and non-words, and the test word list contained 10 words – five control and five analogous words (see Appendix I). The test word list was the same for both story conditions.

Procedure

Approval to conduct research at the Lab School was obtained from the Director of the University Lab School. Prior to testing students at the Lab School, researchers attend familiarization visits in the classrooms to build relationships with the students and to ensure the students will be comfortable leaving the classroom with the researcher. Once consent forms were returned, the researcher visited the classes during child-initiated playtime to test students. The children who had consent forms were invited to go with the researcher to play a game outside the classroom. Testing took place in a small room next to the classroom, which had child-sized chairs and a table for the students to sit at. Prior to testing, participants were randomly assigned to either Story One or Story Two, and then into the rime or repetition condition. In addition, children were also randomly placed into a passive versus active listening condition. Children in the passive condition were only asked to sit next to the researcher while the story was read to them. Children in the active condition were encouraged to follow along with the story by using their finger to follow the words as they were said out loud. The story was read aloud twice to the child to provide exposure to the rhyming words or the repeating word a total of 18 times.

After the story exposure phase, the participant was tested on pronunciation of new words that could be read using analogies to the target words in the story. The researcher presented the child with a set of words containing analogous end words (words where the analogy can be made from the clue word to the ends of the analogous test words; for example, the child can extend their knowledge of the word ‘beak’ to decode the word ‘peak’) and control words that were analogous end words in the other story condition. The control words were unrelated to the target words from the story and could not be read using an analogy strategy. For example, if the target word was ‘rail’, a control word of ‘make’ could be used. The researcher recorded which words

the child correctly pronounced from the list. If the child was using an analogy strategy, the control words should have been pronounced correctly less frequently than analogous words.

The testing procedure took approximately 15 minutes. After each child's participation in the study, the researcher completed the Lab School's "I Participated in Research Today!" form, and placed them in the children's cubbies to take home to their parents.

Pilot Study 1A Results and Discussion

The data obtained from the children at the Lab School provided a number of observations about the appropriateness of the testing procedure and the subsequent results. Two major observations from this pilot were the participants' lack of attention to the visual text and target words in the story, and a lack of word mastery. Ninety percent of the participants in this testing phase had not yet developed the reading skills necessary to understand the new word pronunciation task. For example, a number of participants were unable to recognize the difference between a word and a sentence, and when asked to read a test word would give the researcher a few words or even a full sentence. Means were taken for the participants' scores on the Word Identification test and the Word Attack test, as well as for their test word recognition score. These results are summarized in Table 1.

A number of participants were also unaware of the correspondences between letters and sounds, and were unable to tell the researcher what sound a letter made. Other participants spelled out the letters in each of the test words or sounded out the letters in each word, but were unable to string the sounds together to create a cohesive word. In addition, participants appeared to not focus on the physical pages or text of the story being read to them. It is unclear whether they were not looking at the story text because their inability to read made them uninterested in the text, if the lack of attention was due to the unfamiliarity of the testing room, or if the task

itself was uninteresting or boring to the child. The lack of visual attention was found regardless of which condition (passive or active) the participant was assigned to. In the active condition, when participants were asked to follow along with their finger, they tended to just put their finger on the page and look at the researcher instead of at their finger or the researcher's finger. In order to address these complications, the study was modified to include an attention-focusing component, as well as sampling from an older age range, and retested as Pilot Study 1B.

Pilot Study 1B

Participants

Under the guidance of the Lab School Director, older children in the Kindergarten class (ages 5 to 6) were selected to participate in the study and were sent home with consent forms. These children were selected because of their greater mastery of sight words and deeper understanding of letter-sound correspondences. Six children were selected to participate in this second version of the study and four were given permission by their parents to participate. The four children tested had a mean age of 5 years, 6.75 months, with a range from 5 years, 2 months to 5 years, 10 months at time of testing. Due to the limited number of Kindergarten students enrolled at the Lab School, the possible number of older participants eligible to be tested was quite small.

Materials

The same stories were used in this version of the study as in Pilot Study 1A. The only additional material used in this pilot was a sticker sheet and stickers, which were used to reinforce participants' visual attention to the storybook and the test words being presented.

Procedure

Once their consent forms were returned, participants were tested using the same procedure from the original pilot. Only one modification was made to the procedure of the study. Participants were no longer assigned to the passive or active condition. Instead, all participants were given a sticker sheet at the beginning of the testing session, and were allowed to select stickers at the completion of the Woodcock test and during the reading of the story. Specifically, children were told they could select a sticker every time they saw a 'special' word in the story (e.g., the target words which were bolded). The reasoning behind this modification was that the sticker reward would encourage the child to look at the story text while listening to the words being read aloud, enforcing the phonological-orthographic connection between the sounds of the target words and the visual representation.

Pilot Study 1B Results and Discussion

Through testing the group of older children at the Lab School, it appeared that children around five years of age did not have a clear enough understanding of the phonological-orthographic connection (the connection between print and verbal language) to complete the task. Means were taken for the participants' scores on the Word Identification test and the Word Attack test, as well as for their test word recognition score. These results are summarized in Table 2.

Two of the four participants had no sight-word recognition skills, and all four participants had extremely low non-word decoding abilities. It was also hypothesized that the task developed in the original pilot was not explicit enough in teaching the rime sounds and orthographic patterns to ensure children were able to create an analogy strategy from the training phase. Two out of the four participants were unable to read any of the test words after hearing the story read

to them twice, regardless of whether they were assigned to the rime or repetition condition. One participant was only able to read one of the test words in the story, and it was not a word that could be read using an analogy strategy. The final participant was able to read four of the ten test words, two of which were considered 'analogous' words, and additionally recognized the words 'sake' and 'zake' as 'snake', which was the target word in the story the participant was read. In addition, the very small number of available participants made it difficult to gather enough data to run any statistical analyses. The observations from this second pilot indicated that further modifications needed to be made to the age of the participants to ensure they had appropriate word awareness and reading skill. Modifications to the procedure of the study were also required to more explicitly enforce the word learning in the training phase. These changes are reflected in the second version of this study.

Study 2

Participants

A total of thirteen participants were recruited for this study from Western University's Developmental Participation Research Pool. The age group recruited for participation in this study was between six and eight years of age, with a mean age of 6.8 years, and a range of 6.2 to 8.1 years. All the families on the list were from the London area and surrounding townships.

Materials

The parent or guardian completed a questionnaire regarding the child's and the family's literacy behaviours and whether the child was or had been enrolled in any early literacy programs, for example, a Montessori Casa program (see Appendix II).

Similar to Pilot Study 1A and 1B, there were two word conditions, 'rail' and 'snake' and two reading strategy conditions, rime or repetition. In this version of the study, the child listened

to the researcher read the Test Story (see Appendix III) after completing a rime or repetition training phase (see Appendix IV). The Test Story was created by the researcher and had a similar format and structure to the stories used in Pilot Study 1A and 1B. Ten target test words were embedded throughout the story. Five of the ten target words in the story were analogous rimes to the words in Word 1 condition (rail) and the other five words were analogous to the Word 2 condition (snake). The story was designed this way so that the words from the other Word condition could be used as control words (i.e., the word could not be read using an analogy strategy from the training task).

Procedure

Once consent was obtained from the parent or guardian, the researcher asked the child if they were ready to play a few word games. At this point, the researcher showed the child the testing room and began the testing procedure. While the child was being tested, the parent/guardian was asked to fill out the questionnaire described above.

Participants were first tested on two subscales of the Woodcock Reading Mastery Test to assess baseline reading ability. Similar to Pilot Study 1A and 1B, participants were given the Word Identification task, which tests sight-word recognition, and the Word Attack task, which tests decoding ability for non-words. Then the researcher introduced a ‘word game’ to the participant. Prior to participation, the researcher randomly assigned the participant to either the rime or repetition condition, and into the Word 1 or Word 2 condition (rail or snake). In the rime condition, the child was introduced to the target word and then was asked to come up with words that rhymed with that target word. The researcher guided the child through this exercise by asking them to think of rhyming words that began with a particular sound (e.g., “Can you think of a word that rhymes with rail that starts with a ‘p’ sound?”). For each new rhyming word said

aloud, the child was shown a card that had the word on it (e.g., the word that rhymes with rail that starts with a ‘p’ sound is pail, and then the researcher showed the child a card with the word pail on it). At the end of the rime condition, the child had been exposed to the target word and rimes of the target word nine times. In the repetition condition, participants were given a card with the target word on it, and then were asked a series of questions about the word (e.g., “Do you know what this word is? Do you know what the letters are in this word?”). At the end of the repetition condition, the child had been exposed to the target word eight times.

After this training phase, the researcher read the Test Story to the participant. The researcher read the majority of the story to the child, but the child was asked to read the ‘special’ bolded words in the story. The bolded words in the story were the test words that could be read by using an analogy strategy from the words learned in the training phase. The researcher recorded which target words the child correctly pronounced from the story. As in Pilot Study 1A and 1B, if the child was using an analogy strategy, the control words should have been pronounced correctly less frequently than the analogous words. The testing procedure took approximately 15 minutes. The length of testing fluctuated with how long it took to complete the Woodcock Reading Mastery Test; however, all participants seemed to move through the training task and test phase at the same speed. Similar to Pilot Study 1B, sticker rewards were used to help the participants maintain their attention to the task. Participants were allowed to select stickers after completing each Woodcock Reading Mastery Test subscale, at the end of the training task, and after reading each test word from the story.

Study 2 Results

The frequencies of answers from the parent questionnaire are depicted in Table 3. A correlational analysis was conducted using all the dependent measures in the study (i.e., number

of test words pronounced correctly, Woodcock Word Identification Score, and Woodcock Word Attack Score). The results indicated there was a significant positive relationship between scores on the Word Identification subscale of the Woodcock Reading Mastery Test and the number of test words that were correctly pronounced, r (11) = .83, $p < .01$. Scores on the Word Attack subscale were also highly correlated to the number of correctly pronounced test words, r (11) = .74, $p < .01$. These correlations indicate that test word pronunciation (as an indirect measure of reading ability) is related to ability on the Woodcock subscales, a validated measure of reading ability (Woodcock, 1999) and suggest that the test word pronunciation task used as a measure of reading ability has construct validity and is, in fact, measuring a skill related to reading.

To determine whether reading strategy or word type affected reading ability, a 2x2 between-subjects analysis of variance was conducted with the number of test words pronounced correctly as the dependent variable and word condition (rail/snake) and reading strategy condition (rime/repetition) as the independent measures. The results showed no significant main effect of word condition, F (1, 9) = 1.33, p = .28, partial η^2 = .13, and no significant main effect of reading strategy, F (1, 9) = .02, p = .88, partial η^2 = .00. There was also no significant interaction of word condition and reading strategy, F (1, 9) = .98, p = .35, partial η^2 = .10. Interestingly, the mean number of test words pronounced correctly varied (albeit nonsignificantly) across word type (mean number of correct test words for ‘rail’ = 6.75 and mean number of correct test words for ‘snake’ = 4.00). The total number of test words was 10.

General Discussion

While the results of this study do not support the hypothesis that teaching children different reading strategies (e.g., rime analogies or repeated exposure) can lead to better

performance on new word reading tasks, there are a number of interesting observations from the data that relate to other research in this area of study. Analogy strategies, as described by Goswami (1988), did not seem to be a natural strategy used by children tested in this study to read new, unfamiliar words. Subjectively, phonological/verbal strategies seem to be a much more natural way of learning new words for the participants. For example, one participant was unable to read the word 'fake' in the story, but when provided with a phonological rime cue from the training task, the participant was able to pronounce the word 'fake' immediately. It seemed she was aware of the first letter, but was unsure about how to decipher the rest of the new word correctly, so the provision of the phonological rime cue assisted her in decoding the new word. Additionally, participants seemed to have no difficulties in coming up with phonological rimes in the training paradigm. For example, in the rime training task participants were asked to think of a word that rhymed with the original word, and began with a certain sound (e.g. "Can you think of a word that rhymes with rail and starts with a 'p' sound?"). Most participants easily retrieved the correct rhyming words from memory, without needing to see the orthographic representation of the correct word, suggesting they were using a phonological retrieval strategy.

In regards to orthographic analogy strategies, previous research has examined the point at which children spontaneously use orthographic analogies. A number of studies have suggested that orthographic analogies are not a strategy children use in the early stages of reading development (Wood & Farrington-Flint, 2002). It has been suggested that children do not spontaneously use orthographic analogy strategies until they have a higher level of reading experience (Wood & Farrington-Flint, 2002). From this theory, it has been hypothesized that children completing the clue word paradigm utilize phonological strategies instead of orthographic analogies. In Goswami (1988), children were able to see the clue word (e.g. beak)

while being presented with the test word (e.g. peak), or were shown the clue word then immediately shown the test word. Research on the paradigm used by Goswami (1988) has suggested that having the clue word present primes children to guess words that rhyme with that clue word, rather than prompting them to reflect on the visual similarities between the two words (Wood & Farrington-Flint, 2002). This would provide support for the argument that children are using phonological rhyming strategies in the clue word paradigm instead of orthographic ones. In this study, the participant who was unable to read the word 'fake' until prompted that it rhymed with 'wake' provides some support for the theory of phonological priming. It is possible that participants completing the clue word paradigm rely on the oral pronunciation of the clue word by the researcher in order to be able read the novel word, instead of relying on orthographic similarities. These findings may suggest that the presentation of the clue word, either orally or visually is important in helping children be able to use strategies when reading new words.

The paradigm used in Pilot Study 1A and 1B attempted to determine if word exposure within the story context could facilitate new word learning; however, it became clear that the training exposure was not explicit enough. In Study 2, the paradigm was altered to more closely resemble Goswami's (1988) experiment, which tested the use of analogies in reading prose. In this study, however, participants were taught the clue word(s) in a more explicit training task separate from the story to determine if orthographic analogies could be made without the presence of the clue word at test. The present study did not explicitly compare whether the presence versus the absence of the clue word while reading the test words impacted participants' abilities to use orthographic analogies. Nevertheless, contrary to results found by Goswami (1988), these results suggest that the participants may not extend their usage of the analogy strategy to reading words within the story context. It may also suggest that orthographic analogy

strategies are not naturally used unless the clue word is present alongside the test word. Research by Roberts and McDougall (2003) found that when children trained in rime analogies were tested without the clue word they were unable to remember the clue word and failed to generalize their knowledge to new words. The data from Roberts and McDougall seems to fit very well with the data and anecdotal evidence described in the current study – participants in this study demonstrated excellent phonological awareness of rimes in the training task, but could not extend that awareness to reading new phonologically and orthographically identical rimes in the test story. As in Roberts and McDougall (2003), the participants in this study did not have the clue word present at test, further supporting the idea that when tested without the clue word, children fail to generalize their knowledge to new words. One way to test the theory that the clue word has to be present in order for the orthographic analogy strategy to be used would be to compare performance of children in a condition similar to the paradigm used in this study to a paradigm where the clue word was printed on the page opposite to the story text.

Another interesting feature of these results was the qualitatively distinct patterns of errors that occurred in many participants' test word pronunciations. One pattern of incorrect pronunciation that emerged was the confusion of the short /a/ and long /ā/ vowel sound. Participants frequently pronounced the '-ake' test words (e.g. zake, pake) with the short /a/ sound, instead of the long /ā/ sound. This was somewhat surprising as both 'rail' and 'snake' utilize the long /ā/ vowel sound, but in different orthographic contexts. Participants did not show the same levels of confusion in correctly identifying the long /ā/ vowel sound used in 'rail' and its rime-analogous words, as they did with the '-ake' words. Overall, participants appeared to have much more difficulty in trying to read the '-ake' words than the '-ail' words in the training phase and at test. As described in the results section, participants pronounced more test words

correctly in the ‘rail’ condition (mean number of correct test words for ‘rail’ = 6.75) than in the ‘snake’ condition (mean number of correct test words for ‘snake’ = 4.00). Although these means do not differ significantly from each other, it may suggest that the words differed in difficulty level for the participants in this study. It could be that the ‘-ake’ ending is less familiar to children in the beginning stages of reading development, so they are less aware of the how the silent ‘e’ modifies the pronunciation of the previous vowel sounds to cause the ‘a’ to be a long /ā/. Future research could examine how much experience children in this age range have with the long /ā/ versus the short /a/ sounds and with various word endings, such as ‘-ail’ and ‘-ake’ in order to ensure the words being used are of equal difficulty and that the phonological and orthographic patterns are familiar to the participants.

Another explanation for the patterns of errors seen in test word pronunciation may relate to the extent to which children utilize pragmatic bootstrapping for unfamiliar words. Bootstrapping is simply a way of understanding or deciphering the unfamiliar target language by directing attention towards certain elements of the content through another person’s gestures, actions, or the intended referents (Oller, 2005). For example, children may use the context of the story to decipher what the test word is, such as knowing that the word has to be a name in order to fit into the context of the story (e.g. “His name was Zake” becomes “His name was Zach”), or by utilizing their understanding of morphemes and guessing words that start with the same two letters as the test word (e.g. ‘pake’ – guessing ‘pack’, ‘park’). In addition, the participants often combined their ability to use the context of the story to guess what the word should be with their phonetic awareness of the letter-sounds in order to read the novel words. For example, they combined their awareness that the first two letters of the word were ‘Z-a-‘ with the knowledge that the word had to be a name, and so guessed 'Zach’ for the test word ‘Zake’. There has been

evidence to support the idea that when unknown words are encountered in context, children can and do use semantic, syntactic, or pragmatic information from the text to pronounce and understand the novel word (Ricketts, Bishop, Pimperton, & Nation, 2011). The findings of the current study support the idea that beginner readers use bootstrapping strategies in order to decipher novel words. One way of testing how children use the context of text when decoding new words would be to compare the performance and the types of errors made in new word recognition when reading test words in a story context (e.g., the paradigm in Study 3) to reading test words in isolation (e.g., the paradigm in Pilot Study 1A and 1B). If children are drawing on external cues such as the contextual cues provided by the sentence (e.g. "His name was…") similar patterns of errors in responses should emerge, such as in this study where 61% of participants incorrectly pronounced 'Zake' as 'Zach'. Expanding the research to include comparisons of context and children's experience with varying vowel sounds would allow for a fuller understanding of why the errors mentioned above tend to occur.

A number of anecdotal observations from this study highlight possible limitations and improvements, as well as future directions for this research. Two clear groups of participants emerged in this study: participants who possessed good reading skills, and participants who struggled with reading sight words and test words. Both groups, however, failed to use the orthographic analogy strategy in the way we expected. The good readers did not seem to need a strategy to decipher new words, or were doing so unconsciously, while the poorer readers did not appear to use the orthographic analogy as suggested by Goswami (1988). This may suggest that there is a small time window in which reading strategies can be explicitly taught and used by children, prior to becoming fluent readers but following some literacy awareness. There are average literacy abilities among 6-year-olds, but there is still much of variation particularly in

those entering their first year of school (Logan, Hart, Cutting, Deater-Deckard, Schatschneider, & Petrill, 2013). This variation is evidenced in this study by the wide range in Woodcock Word Identification subscale scores – of the 11 children tested in Study 2 who were 6 years of age, Word Identification scores ranged from 1 to 61 words correctly pronounced. From this, it is difficult to narrow down a point where children are not yet fluent readers, but still possess knowledge of letters, sounds, and the properties of words. Prior research has shown that readers at the end of Grade 1 are more likely to use orthographic rime analogies than children at the beginning of Grade 1, and that the proficiency with which a child can utilize orthographic analogies increases with grade level (Bowey et al., 1998). The increase in proficiency as a possible function of grade level suggests that orthographic analogies are not regularly or naturally used strategies by beginning readers. This provides support for the suggestion that the children participating in this study were using alternative strategies in order to decode the novel words, such as contextual cues and pragmatic bootstrapping.

In addition, sociocultural factors may have influenced performance in this study. In their discussion on Goswami's research on orthographic analogies, Bowey et al. (1998) pointed out that at the time Goswami conducted her studies in England, the focus of reading instruction was on whole-word reading, and so those children might have focused less on explicit grapheme-phoneme knowledge and more on whole-word decoding. The sample used in this study consisted of children in the second half of Grade 1 or 2, following the Ontario elementary school curriculum. The Ontario curriculum for early reading development places a large emphasis on the development of phonemic awareness through the manipulation of language sounds such as rhyming and the use of phonics as an instructional approach, and the use of contextual cues to decode unfamiliar words (Ontario Ministry of Education, 2003). These discrepancies in reading

instruction may have played a role in the lack of usage of orthographic analogies in this study as well, and lend support to the idea that the children in the current study relied more heavily on phonological and contextual cues in order to read the novel test words. Future research could examine the differences in the usage of orthographic analogies in groups of children being taught to read using phonics versus whole-word decoding strategies.

Another direction this research could take would be to examine the use of orthographic analogy strategies in children labelled as poor readers or as having significant reading difficulties. It seems that children who are proficient readers already know how to decipher novel words and likely use orthographic analogy strategies spontaneously. It is not clear how poor readers would fare in this paradigm, and whether the explicit teaching of a strategy would assist them in decoding new words. It is possible that children considered to be poor readers might benefit from being taught orthographic analogy strategies as some reading disorders include phonological deficits (Kim & Davis, 2004). These phonological deficits affect the process of reading acquisition by limiting the extent to which the child can teach him or herself to read (Kim & Davis, 2004). By teaching explicit orthographic analogy strategies to children with reading deficits, it might be possible to develop new ways of decoding novel words that do not require phonological processing.

Another clear pattern that emerged was that participants demonstrated a poor understanding of the usability of the strategy they were being exposed to (e.g. seeing words that look similar and knowing they have similar sounds). They also showed a lack of ability in extending a strategy from one type of task to another (e.g. from the riming task to reading words in a story context). This finding relates to research that addresses children's usage of general cognitive strategies. Strategies that are more helpful for older children can often provide little or

no help to younger children in recall (Miller, Seier, Barron & Probert, 1994). When young children first utilize a novel strategy, they often do so erratically and with great difficulty, and the strategy may not actually benefit the child's performance (Miller et al., 1994). Children tend to demonstrate one of three types of difficulties in using strategies throughout development: (1) they may fail to produce the strategy and fail to benefit from it when instructed to use it, (2) they may fail to produce the strategy but can benefit from it when instructed to use it, or (3) they are able to produce the strategy but fail to benefit from it (Miller et al., 1994). The results of this study suggest that the participants are failing to produce the strategy and do not benefit from it; however, it is possible that if participants were instructed to use the strategy taught, much as in Goswami's (1988) paradigm, they might have been able to use it and benefit from the strategy. Future extensions of this study could examine whether children are better able to utilize the orthographic analogy strategy in the story context if explicitly instructed to do so.

While the participants might have been unable to use the strategy taught to them, this lack of ability might also have been due to a mismatch between the task structure of the training paradigm (e.g. verbally presenting the word prior to seeing it orthographically represented) and the task structure of the test (e.g. reading words embedded in a story). It seems that there was a missing link between the phonological and orthographic practice occurring in the training phase and performance at test. It is possible that because participants were adept at verbally providing an appropriate response in the training paradigm, they were less aware of or interested in the visual aspect of the task. Another possible explanation for this missing link between the training task and the test could be due to the delay between the training task and the test word story reading. Participants were allowed to select a sticker following the completion of the training task, and some participants took much longer to select a sticker than others. This delay may have

led to a lack of memory of the orthographic patterns at test. Anecdotally, a number of parents mentioned they had noticed their child did not extend letter patterns of previously learned words to new words. For example, one parent explained that spelling lists sent home by the teacher often consisted of similarly formed words (e.g. bean, lean, mean), but their child did not automatically extend their knowledge from one word to the next on the list. This parental observation directly relates to children's inability to produce a strategy that would allow them to more easily decipher new words and supports research suggesting that strategy use in young children is often infrequent, sporadic, and unhelpful for the child (Miller et al., 1994).

With regards to parental observations, the results of Parent Questionnaire did not show any differences between participants. Answers on the questionnaire indicated that the families in this study were homogeneous in their literacy behaviours and experiences (Table 3). A further limitation of this measure was that the questions asked were largely categorical in nature and therefore could not be statistically analyzed in a meaningful way. It remains for future research to determine how familial and social factors may impact reading strategy usage. It is possible that other sociocultural factors may have influenced the results in this sample, as it is well known that academic achievement is correlated with socioeconomic status (American Psychological Association, n.d.). For example, it requires disposable income to send one's child to preschool, to have books in the home, and to be able to spend time reading with the child. However, this study contained an unusual sample that did not possess any diversity with regards to these factors, so the impact of such factors cannot be determined. It is possible that the sample Goswami (1988) used may have accounted for these factors because the majority of their work took place within the school system, increasing the diversity in participants.

There are a number of possible improvements that could be instituted if this study were to be extended. First, it would be critical to conduct pre-testing to determine what phonological and orthographic patterns are most familiar to children in order to select two equally difficult and familiar target rime patterns. As previously mentioned, it does not appear that 'rail' and 'snake' are equal in difficulty level. It would also be important to develop test words that cannot be read using contextual clues, such as being cued to think of a word that is the name of someone. Finally, the design of the paradigm used in Study 2 may need to be modified so that the structure of the test (e.g. reading words in a story) more closely matches the explicit structure of the orthographic analogy task, where children were clearly taught to pronounce the target word (e.g. Goswami, 1988). In order for the orthographic analogy to be made, it seems there must be a clear connection between the phonological and orthographic representations of the word, and it is unclear if the paradigm used in this study achieved that connection.

Research in the area of children's abilities to make orthographic analogies is divided at this point in time. Many researchers feel there is sufficient evidence to suggest that children tend to respond using phonological priming when tested using the clue word paradigm (e.g. for a review, see Roberts & McDougall, 2003), while other researchers still agree with the orthographic analogy strategy put forward by Goswami (1988) (Wood & Farrington-Flint, 2002). What is still lacking is an exploration into the extension of the use of these strategies in a real-world reading context, like storybooks. This study was an attempt to extend the analogy strategy research in this direction.

At a minimum, this study suggests that the phonological strategies are a more natural strategy that early readers can utilize in order to learn how to decipher new words. In addition, this study demonstrates that there is a clear threshold at which direct instruction in reading

strategy is redundant, as the child has developed a fluent understanding of how to decipher novel words subconsciously. However, it is still unclear when children cross this threshold, as it does not seem to be age-related, judging by the tremendous variation in reading skill among the six-year-olds tested in this study. This study provided an examination of the role of priming children to use reading strategies and to what extent the use of the orthographic analogy strategy could be generalized to a larger reading context (e.g. in storybook reading). Future research studies in this area could focus on establishing how reading strategies develop in more naturalistic settings such as during shared story reading or when children read on their own. In addition, further research into how children's stories employ rime and repetition in their structure might illuminate how exposure to those components in a non-experimental manner facilitates children's reading skills, and how rime and repetition are used as natural reading strategies. It is still unclear how the connection between orthographic and phonological abilities develops in the process of learning to read. This study and other research on the use of orthographic versus phonological strategies have attempted to shed some light on how children begin to connect auditory and visual representations of words in order to develop strategies to decipher novel words.

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Table 1

Pilot Study 1A Scores on Woodcock Reading Mastery Test and New Word Recognition Task

Number of children unable to read	Word Identification score (M)	Word Attack score (M)	Test word recognition score (M)
9	0.3	0.4	0

Note: 10 participants' results were included in this analysis

Table 2

Pilot Study 1B Scores on Woodcock Reading Mastery Test and New Word Recognition Task

Number of children unable to read	Word Identification score (M)	Word Attack score (M)	Test word recognition score (M)
2	16	1	1.25

Note: 4 participants' results were included in this analysis

Table 3

Frequencies of Parent Questionnaire Responses

Question	*Yes Response*	*No Response*
Read aloud by themselves	12/13	1/13
Recognize letters	13/13	0/13
Has books at home	12/13	1/13
Attended preschool	9/13	4/13
Attended early reading program	3/13	10/13
Limit TV watching	1/13	12/13
Stress importance of reading	13/13	0/13
Read aloud to child	13/13	0/13
Wide variety of reading materials at home	13/13	0/13
	3 to 4 days per week	5 to 7 days per week
Number of days child reads at home	1/13	12/13
	Sometimes	Always
Enjoys looking at books alone	4/13	9/13
Talk about stories while reading	7/13	6/13

Note: 13 participants' results were included in this analysis

Appendix I

Story One: ***Rime condition (9 rime words)***
When I was little, my brother took me to see the big pond. It had an iron **rail** all around it to stop children from falling in, and I had to stand on a **pail** to see over it. Once I was up I could watch the little ducks **sail** by, some with fluffy **tail** feathers, and even some swans in pairs swimming slowly up and down. Then we walked down a **trail**, and we saw where the swans had lay their eggs. The eggs were very **frail**. Then we walked around the pond. I saw a **snail**! When we went home we had to **hail** a taxi, because it started to rain. Even though it was raining, I still had to get the **mail.**
Rail, pail, sail, tail, trail, frail, hail, mail

Story One: ***Repetition condition (9 repetitions)***
When I was little, my brother took me to see the big pond. It had an iron **rail** all around it to stop children from falling in. The iron **rail** was very thick. The **rail** was also very tall. My brother had to raise me up to see over the **rail**. Once I was up over the **rail**, I could watch the little ducks swim by, and some had fluffy feathers. Some of them were very close to the **rail**. Afterwards we saw where the swans had lay their eggs behind the **rail**. When we left we had to walk around the **rail** to get a taxi, because it started to rain. When we got home, I saw a **rail** around my house just like at the pond.
Rail

Story Two: ***Rime condition (9 rimes)***
When I was little, my brother took me to see animals. We had to **wake** up early to get there. We saw a **snake** and it lived near a **lake**. A man picked up garbage with a **rake**. He said his name was **Jake**. He took care of the animals. I wanted to **make** him a card to say thank you for looking after the animals. I wanted to **take** one home to be a pet, but my brother said no. When we got home, my mom said I could help her **bake**. We made a **cake** shaped like a dog!
Wake, snake, lake, rake, Jake, make, take, bake, cake

Story Two: ***Repetition condition (9 repetitions)***
When I was little my brother took me to see a **snake**. The **snake** lived near a pond. I got up early to go see the **snake.** I wanted to bring the **snake** something to eat. But I don't know what a **snake** eats. The **snake** was very big and green. There was a man who took care of the **snake**. I asked my brother if I could bring the **snake** home. He said no. When we got home I told my mom all about the **snake**.
Snake

Test Words:
Wail Jail Bail Gail Dail Fake Brake Sake Pake Zake

Appendix II

Rime Condition 1:

- This word says **rail.**
- Can you say **rail**?
- Can you think of any words that rhyme with **rail**?
- What about a word that rhymes and starts with a ‘p’ sound? **pail**
- Or a ‘s’ sound? **Sail**
- A ‘t’ sound? **Tail**
- A ‘m’ sound? **Mail**
- A ‘h’ sound? **Hail**
- What about a ‘tr’ sound? **Trail**

Repetition Condition 1:

- This word says **rail**.
- Can you say **rail**?
- Do you know what letters are in **rail**?
- R, A, I, L
- That spells **rail**
- Do you know what a **rail** is?
- (That’s right) A **rail** is a long piece of metal that creates a fence
- Have you seen a **rail** before?

Rime Condition 2:

- This word says **snake.**
- Can you say **snake**?
- Can you think of any words that rhyme with **snake**?
- What about a word that rhymes and starts with a ‘w’ sound? **Wake**
- Or a ‘l’ sound? **Lake**
- A ‘t’ sound? **Take**
- A ‘m’ sound? **Make**
- A ‘r’ sound? **Rake**
- What about a ‘b’ sound? **Bake**

Repetition Condition 2:

- This word says **snake.**
- Can you say **snake**?
- Do you know what letters are in **snake**?
- S, N, A, K, E
- That spells **snake**
- Do you know what a **snake** is?
- (That’s right) A **snake** is an animal that slithers along the ground
- Have you seen a **snake** before?

Appendix III
Rhyming versus Repetition in Children's Stories
Parent Questionnaire

1. Does your child read out loud by themselves?
   Yes No

2. Does your child recognize letters?
   Yes No

3. Does your child enjoy looking at books by themselves?
   Sometimes Always Never

4. If you read aloud, do you and your child talk about the story while reading?
   Sometimes Always Never

5. How many days a week does your child read at home?
   0-2 days 3-4 days 5-7 days

6. Does your child have books at home?
   Yes No

7. Did your child attend preschool?
   Yes No

8. Did your child participate in any early reading programs or preschool programs that emphasized reading? (i.e. Montessori)
   Yes No

Please check all of the following that apply to you:

_____ I stress the importance of reading to my children.

_____ I limit the amount of time my children watch TV.

_____ I read aloud to my children and encourage them to do so to me.

_____ I have a wide variety of reading materials around the house.

Appendix IV

Once upon a time, I met a **dail**.
He was very nice.
His name was **Zake**.
He was from a place called **Gail**.
He lived in a **pake**. I don't know what that is.
His favourite food was blue **cake**.
But he also liked **jail** pudding.
He taught me lots of things, like how to **bail** water out of a boat.
He also showed me how to **brake** when I ride my bike.
He also taught me how to **wail** like an owl.
But I think his hair was **fake**.

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