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EXAMINING THE EFFECTS OF SKILL LEVEL AND READING MODALITY ON
READING COMPREHENSION

by

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A Thesis

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Abstract

Dickens, Rachel Haley. Ph.D. The University of Memphis. May/2016 degree to be conferred. Examining The Effects of Skill Level and Reading Modality on Reading Comprehension. Major Professor: Elizabeth Meisinger, Ph.D.

The purpose of this study was to examine the effects of reading skill and reading modality, oral versus silent, on reading comprehension. A normative sample of sixth grade students ($N = 74$) read texts aloud and silently and then answered questions about what they read. Reading skill was assessed by the Test of Word Reading Efficiency, Second Edition (TOWRE-2, Torgesen, Wagner, & Rashotte, 2012) and students were identified as either normal or at-risk readers based on those scores. A 2 (reading skill) X 2 (reading modality) mixed factorial ANOVA was conducted. Students answered more comprehension questions after reading passages orally than after reading passages silently; however, normal and at-risk readers did not differ in terms of their reading comprehension across the texts. These findings suggest that students transitioning to middle school may struggle with independent, silent reading, and may benefit from additional pedagogical support.

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Examining the Effects of Skill Level and Reading Modality on Reading Comprehension

Silent reading is an essential skill for every day life. Proficient adult readers rarely read aloud, and as Share (2008) points out, “silent understanding rather than oral reading is the literacy benchmark in knowledge-based societies” (p. 594). However, initial reading instruction primarily involves students reading aloud. Oral reading allows for teachers and students to monitor reading progress (Hiebert, Samuels, & Rasinski, 2012; Kuhn & Schwanenflugel, 2007), thereby guiding interventions and facilitating corrective feedback. Oral reading may also benefit beginning or struggling readers as it allows for the reinforcement of letter-sound correspondence (Kuhn & Schwanenflugel, 2007) and the use of both reading and listening comprehension skills to facilitate understanding (Hoover & Gough, 1990; Kuhn & Schwanenflugel, 2007). By around the fourth grade, the curriculum focus shifts away from learning how to read. Instead, students are expected to utilize their fluent readings skills to acquire content area knowledge (Chall, 1996; Yovanoff, Duesbery, Alonzo, & Tindal, 2005). Students undergo a shift in modality where they transition from reading aloud to reading silently in their heads (Prior & Welling, 2001). As students become proficient readers, they should be able to read faster and with equivalent comprehension silently, no longer requiring the additional support that oral reading provides (Hiebert et al., 2012). However, there is conflicting information in the current literature as to exactly when the transition from effective oral to silent reading takes place.

Independent silent reading is the desired outcome of literacy instruction, yet the literature places disproportionate focus on oral reading (Kim, Wagner, & Foster, 2011;

Share, 2008). This dearth in the literature may be due, at least in part, to the fact that silent reading is not an observable behavior, and therefore, may be a more difficult construct to measure (Denton et al., 2011). Students are seldom asked to read aloud beyond the elementary school years. Pedagogical support is rarely provided to students regarding how to silently read and extract information in an independent manner (Hiebert et al., 2012), despite evidence suggesting that scaffolded silent reading fluency instruction, or the process of providing instructional support tailored to the needs of the student with the intention of helping the student achieve his or her learning goals (Sawyer, 2006), is beneficial for students (Reutzel, Jones, Fawson, & Smith, 2008; Reutzel, Petscher, & Spichtic, 2012; Sanacore, 2002). Students whose reading experiences occur primarily in a setting where heavy attention is placed on oral reading without providing scaffolded instruction in silent reading may not develop the skills required for full participation in higher education and in the future workplace (Hiebert et al., 2012). Understanding the timing of the oral to silent reading transition is essential to ensuring that students receive the pedagogical support necessary to read and learn independently from texts.

Comprehension after Oral and Silent Reading

The literature investigating the effect of reading modality (i.e., oral versus silent) on reading comprehension is essentially equivocal (Hale et al., 2007). Some researchers have found that students comprehend better after reading orally (e.g., Elgart, 1978; Fletcher & Pumfrey, 1988), and others have reported comparable comprehension after oral and silent reading (e.g., Juel & Holmes, 1981). Differences across studies in the grade level or reading skill of participants may shed some light on these disparate

findings.

Several studies have examined reading modality using small samples comprised of students from a single grade or discrete age range. Kragler (1995) asked 32 first grade students to either read silently or to orally "mumble read" (p. 395). Students who were allowed to mumble read had higher reading placement scores than those who read silently. Fletcher and Pumfrey (1988) compared the effectiveness of oral reading, silent reading, and listening in a sample of 36 seven-and eight-year-old students. All students were administered three passages and then answered questions about each passage: one was read silently, one was read orally, and one was listened to as a teacher read the passage. Students demonstrated superior comprehension after the oral reading and listening passages as compared to those that were read silently. Elgart (1978) found similar results when examining the reading comprehension skills of 45 third graders after presenting each child with information to which he or she listened, read orally, or read silently. The oral reading group showed significantly higher comprehension scores than the students in the other two modality groups. Together, these findings suggest that younger readers (i.e., first through third grade) tend to comprehend text better after reading orally as compared to silently.

Burge (1983) examined the effect of reading modality on the reading rate and comprehension of 18 fourth grade struggling readers who read passages of varying difficulty. When students read the more challenging instructional and grade level texts, comprehension was enhanced when students read orally as compared to silently. However, when text was presented at the student's independent level, no difference in comprehension was found between oral and silent reading. Much like their younger

counterparts, struggling readers may also benefit from reading aloud, especially when the text is more challenging.

Several cross-sectional studies have examined the effect of reading modality on comprehension with participants in multiple grades levels, but those data were collapsed, obscuring potential grade-level trends. For example, Miller and Smith (1985) utilized a sample of 94 students in second through fifth grade. Reading comprehension scores were found to be moderated by their reading skill: low skill readers had higher comprehension scores after reading orally; medium skill readers had higher comprehension scores after silent reading; and high skill readers comprehended equally well after executing both reading modalities. Fuchs and Maxwell (1988) examined the effect of reading modality on comprehension in a sample of 44 third through eighth grade boys diagnosed with learning disabilities. The results of this study indicated that oral reading facilitated comprehension better than silent reading. McCallum, Sharp, Bell, and George (2004) utilized a sample of 74 students in kindergarten through sixth grade who were randomly assigned to read passages either orally or silently and then answered literal and inferential questions about the passages. Reading skill was used as a covariate in this study. Results indicated that, after controlling for reading skill, there was no significant difference across reading modality in terms of comprehension.

A handful of studies have explicitly examined the influence of development on the relation between reading modality and comprehension using cross sectional designs; however, results from these studies have been inconclusive in determining the exact timing of the transition from effective oral to silent reading. Juel and Holmes (1981) compared oral and silent reading at the sentence level in a sample of 48 second and fifth

grade students. The students were categorized into either high or low skill levels. Half of the students read sentences orally and half read them silently. To assess comprehension, the participants indicated which of four schematic drawings matched the content of the sentence that they had read. Results of the study indicated that there was no difference in comprehension between the two reading modalities. Consistent across both grades and reading skill levels, high skill readers comprehended well after both oral and silent reading, and less skilled readers comprehended poorly using both modes. This study only addressed reading comprehension at the sentence level; therefore, findings from this study may not generalize to reading passages comprised of connected text.

Prior and Welling (2001) examined the effect of reading modality on comprehension in a sample of 73 second through fourth grade students. This study found that second graders comprehended equally poorly after engaging in both reading modes, which is inconsistent with the larger literature. In contrast, third and fourth graders were found to comprehend better after reading orally. Methodological limitations may have influenced these results. Prior and Welling (2001) suggested that the passages used for each grade might not have been incremented equally in difficulty level. Prior et al. (2011) replicated and extended the study to include middle school students. One hundred and seventy first through seventh grade students read grade-appropriate passages orally and silently and answered comprehension questions about each passage. The results of this study depicted a clear grade-related trend in which oral reading was the superior mode for comprehension in first through fifth grades. In sixth grade, neither mode was superior to the other in terms of comprehension. Finally, in seventh grade, silent reading emerged as the better mode for comprehension. The results of these two studies should be interpreted

with caution, as the sample size within each grade was modest (e.g., 20-29), and the potential role of skill level as a moderator was not examined.

Hale et al. (2007) examined reading modality and comprehension with elementary and high school students. Fifty-one fourth and fifth grade students and 42 tenth, eleventh, and twelfth grade students were asked to read a series of grade-level passages orally and silently and then answer multiple-choice questions about each passage. Hale et al. (2007) found that comprehension was significantly higher when students read passages aloud as opposed to silently across both the elementary and high school groups. These results are consistent with the broader literature examining elementary students, but the finding that high school students still benefited from oral reading is somewhat surprising.

The extant literature is inconclusive regarding the exact timing of the transition from effective oral to silent reading. Many studies examining this issue are hindered by methodological limitations. Most investigations have used relatively small samples sizes. When researchers have used larger samples, they have often done so by collapsing students across multiple grade levels (Fuchs & Maxwell, 1988; McCallum et al., 2004; Miller & Smith, 1985), obscuring potentially important grade-level trends. The skill level of the students appears to be an important factor in examining the effect of reading modality on reading comprehension, but that variable is often not examined (Elgart 1978; Fletcher & Pumfrey, 1988; Hale et al., 2007; Kragler, 1995; Miller & Smith, 1985) or has been used as a covariate (McCallum et al., 2004). Much of the literature has investigated students in the primary grades (Elgart, 1978; Fletcher & Pumfrey, 1988; Kim et al., 2011; Kragler, 1995), overlooking students in the late elementary and middle school years.

Purpose of the Study

As students transition from elementary to middle school, they are expected to read and understand grade-level text in an independent manner (Misulis, 2009), yet it is unclear whether students typically emerge from elementary school with the skills necessary to comprehend what is read silently as well as what is read orally. The purpose of the present study was to examine the effect of reading skill and reading modality on reading comprehension in a normative sample of sixth grade students. The following research questions guided the proposed study: (a) how does modality, oral versus silent, affect reading comprehension, (b) how does skill level affect reading comprehension, and (c) how do reading modality and skill level interact to affect reading comprehension? Considering the limitations of the current literature and the importance of proficient silent reading for later educational and professional attainment, this topic warranted further examination.

Method

Participants

Participants consisted of 74 students attending the sixth grade at a rural public school in the Mid South region of the United States. Students' ethnicity was 43.2% Caucasian, 44.6% African American, 1.4% Asian/Pacific Islander, 2.7% Hispanic, and 5.4% other. Average age was 11 years, 7 months, and 60.8% of the participants were girls. Approximately 59% of students at the participating school qualified for free or reduced cost lunch. All children attended general education classes, and none were excluded on the basis of reading disability or other special education eligibility.

Measures

Word reading fluency. The Test of Word Reading Efficiency, Second Edition (TOWRE-2; Torgesen, Wagner, & Rashotte, 2012) measures an individual's ability to fluently read words and phonemically regular nonwords. The Sight Word Efficiency (SWE) subtest assesses the number of real words printed in vertical lists that an individual can accurately identify within 45 seconds. Similarly, the Phonemic Decoding Efficiency (PDE) subtest measures the number of pronounceable nonwords presented in vertical lists that an individual can accurately decode within 45 seconds. These two subtests comprise the Total Reading Efficiency composite, which yields standard scores ($M = 100$, $SD = 15$) and percentile ranks. For the Total Word Reading Efficiency score, the test manual reports a test–retest reliability coefficient of .94 for children 8 to 12 years of age (Torgesen et al., 2012). Further, the Total Word Reading Efficiency score demonstrates strong relations with other measures of word reading and oral reading fluency, with reported average correlations of .95 and .96, respectively. Given the important role of fluent word identification and decoding to supporting the reading of connected text, the TOWRE-2 is an appropriate proxy for students' basic reading skills. Standard scores from the Total Reading Efficiency (TRE) composite were used to determine the reading skill level of each participant and establish groups of normal (i.e., TRE standard scores ≥ 90) or at-risk (i.e., TRE standard scores < 90) readers.

Text reading fluency and comprehension. The Qualitative Reading Inventory, Fifth Edition (QRI-5; Leslie & Caldwell, 2011) is an informal reading inventory assessment instrument that contains narrative and expository passages at each grade level. There are seven sixth grade passages in the QRI-5: three literature passages ("Pele,"

"Abraham Lincoln," and "The Early Life of Lois Lowry"), two social studies passages ("The Lifeline of the Nile" and "Building Pyramids"), and two science passages ("Temperature and Humidity" and "Clouds and Precipitation"). The QRI-5 authors used the mean of three readability formulas: the New Dale-Chall readability formula, the Fry Readability graph, and the Flesch Grade Level, to estimate the readability levels of each passage. Based on these formulas, the mean readability levels for each passage is as follows: "Pele" is 5.6, "Abraham Lincoln" is 5.7, "The Early Life of Lois Lowry" is 6.6, "The Lifeline of the Nile" is 6.9, "Building Pyramids" is 6.6, "Temperature and Humidity" is 7.5, and "Clouds and Precipitation" is 6.2.

Two passages, "The Early Life of Lois Lowry," and "Clouds and Precipitation" were eliminated from the study because they were significantly longer (i.e., both containing at least 200 more words) than the other passages. According to the authors, "Temperature and Humidity," reads at a 7.5 grade level. It was suspected that this passage could potentially be too difficult for sixth grade students to read, and therefore, was also eliminated from the study. The average word length of the remaining four passages selected for the study was 327 ($SD = 29$), ranging from 295 to 358.

Students were asked to read two passages, one passage silently and the other aloud (see Instructions, Appendix A). The time that it took to read each passage was recorded using a stopwatch. Miscues (i.e., reading errors) were recorded for passages read orally. After reading each passage, the participant was asked eight open-ended questions, yielding a Comprehension score. Four questions were explicit, assessing whether the student could understand and remember information stated directly by the author, and 4 were implicit, assessing the reader's inferencing abilities (QRI-5; Leslie &

Caldwell, 2011). The QRI-5 manual reported strong inter-rater reliability of .98 for Comprehension scores. Regarding proportion of correct scores on sixth grade Comprehension, narrative texts yielded a mean score of .68 ($SD = .17$) and expository texts yielded a mean score of .67 ($SD = .18$). The QRI-5 was selected as a measure of reading comprehension for the present study, in part, because research examining the QRI-4 suggested that this measure is less reliant on the participant's decoding skills to comprehend the passage text than similar reading comprehension measures (Keenan, Betjemann, & Olson, 2008). Instead, variations in QRI scores were accounted for primarily by listening comprehension. Additionally, the comprehension questions associated with other popular reading comprehension measures have been shown to be more dependent on prior knowledge than actual comprehension of the text (Keenan & Betjemann, 2006).

Procedure

Data collection took place in January 2014. Policies and procedures dictated by The University of Memphis Institutional Review Board were strictly adhered to throughout the study. Written parental consent and child assent were required for participation in the study. Parental consent forms were distributed to students in sixth grade regular education classrooms several weeks prior to the study. A small incentive was offered to students who returned completed forms (i.e., stickers, pencils, erasers). Examiners were four school psychology graduate students trained in psychoeducational assessment. Prior to the study, each examiner practiced coding the necessary measures from audio recordings of students' reading, achieving 100% agreement. All testing sessions were audio recorded. The principal investigator reviewed 100% of the examiner

recordings and completed the administration integrity checklist for each recording. There was only one instance of an examiner slightly deviating from reading verbatim instructions, which did not appear to impact the participant's score. Using these recordings, 25% of the participants were randomly selected (Research Randomizer; Urbaniak & Plous, 2014) and assessed by a blind reviewer to ensure inter-rater agreement. Discrepancies were seldom ($< 5\%$), occurred primarily on QRI comprehension questions, and were resolved through discussion between the first author and the reviewer.

A mixed between-within-subjects design was used in this study. The reading modality condition (QRI-5 passages read orally versus silently) served as the within-subjects independent variable, reading skill (average versus at-risk as measured by the TOWRE-2) served as the between-subjects independent variable, and reading comprehension (number of questions answered correctly after reading the QRI-5 passages orally or silently) served as the dependent variable. The TOWRE-2 was administered first, and the two QRI-5 passages (one read silently and the other aloud) were administered during the second day of administration. All reading tasks were individually administered in the school library during school hours. After completing the reading tests, students received a sticker, pencil, or eraser as a token of thanks. A Latin square design was used to counterbalance the administration order of the passages across the two reading conditions so that all participants were presented with each possible order combination.

Results

Data Processing and Screening

Data for all dependent and independent variables used in the analyses were screened for missing data points, outliers, distributional properties, and parametric assumptions. No out of range data were found. One subject was missing the oral and silent reading passages data. Little's Missing Completely at Random test (Little, 1988) was not significant, $\chi^2(1, N = 74) = .346, p > .05$, suggesting that the missing values were missing completely at random. The SPSS estimation maximization algorithm was used to estimate the missing data for that case. No outliers were identified in the data set (i.e., z-scores < 3.29 ; Tabachnik & Fidell, 2013); skewness and kurtosis statistics fell within acceptable limits (i.e., < 2.0 ; Tabachnick & Fidell, 2013). Levene's test for homogeneity of variance was not statistically significant, indicating that the assumption of homogeneity of variance was not violated.

A one-way ANOVA was used to check for administration order effects on reading comprehension after oral and silent reading. An effect was evident for passages that were read orally, $F(3, 69) = 3.98, p = .011$. A Tukey's post hoc test revealed that students correctly answered a greater number of reading comprehension questions after orally reading "Abraham Lincoln" ($M = 6.25, SD = 1.25$) than after orally reading "The Lifeline of the Nile" ($M = 4.28; SD = 1.93$), $p = .007$. Passage effects are a common issue in the literature and are rather expected (see Christ & Ardoin, 2009; Francis et al., 2008). A fully counterbalanced design was used to ensure that all passages were distributed equally across the two modality conditions, thereby attenuating the influence of this potential confound. Passage effects were not found on reading comprehension when students read

silently, $F(3, 69) = 0.09, p = .963$. No effects were detected for administration order for either silent reading, $F(1, 72) = 1.59, p = .212$, or oral reading, $F(1, 72) = 0.17, p = .684$.

Descriptive Statistics

Based on the average performance on the normative measure of word reading fluency (TOWRE-2 $M = 95.84, SD = 13.9$, range 66-124), many of the students participating in this study may be considered at-risk in terms of their overall reading skill. For the QRI-5 passages, on average, students answered 65.75%, or 5.26 (of 8) questions correctly ($SD = 1.91$) after oral reading and 53.75%, or 4.30 (of 8) questions correctly ($SD = 2.06$) after silent reading. As would be expected, students read more words per minute when passages were read silently ($M = 171.37, SD = 35.24$), $t(73) = 37.56, p = .000$, than when the passages were read aloud ($M = 126.12, SD = 46.35$), $t(73) = 30.56, p = .000$.

Analyses of Variance

A 2 (reading skill) X 2 (reading modality) mixed factorial ANOVA was conducted to determine if these variables influenced reading comprehension (see Tables 1 & 2). A significant main effect for reading modality on reading comprehension as measured by the QRI-5 was observed, $F(1, 72) = 13.63, p < .000, \eta^2 = .159$. However, no main effect was found for reading skill as measured by the TOWRE-2, $F(1, 72) = 2.308, p = .133, \eta^2 = .031$. Additionally, no significant interaction effect was found between modality and skill level, $F(1, 72) = .920, p = .341, \eta^2 = .013$ (see Figure 1). The ANOVA analyses indicate that at the sixth grade level, students in this sample performed better on reading comprehension tasks after reading orally versus silently, and reading skill did not seem to have a discernible effect on comprehension.

Discussion

Students entering middle school are expected to be to independent silent readers who can utilize grade level text to access content area information (Misulis, 2009). The purpose of the present study was to examine the effects of reading skill and reading modality on reading comprehension in a diverse sample of sixth grade students. Results from this study suggest that students may enter their middle school years without the reading skills necessary to participate fully in the curriculum.

Students who participated in our study demonstrated better comprehension of text read orally as compared to text read silently. Excluding studies where data were collapsed across a wide range of grades, only a handful of studies have examined the influence of modality on reading comprehension in this age group (i.e., Hale et al., 2007; Prior et al., 2011). Consistent with our findings, Hale et al. (2007) found that late elementary students (grade 4-5) as well as high school students (grade 11-12) benefited in terms of their reading comprehension from reading text orally as opposed to silently. It is noteworthy that many of those elementary (39%) and secondary (57%) students were below grade level based on their *Woodcock-Johnson Achievement Tests, 3rd ed.* (WJ-III Ach; McGrew & Woodcock, 2001) Broad Reading Cluster grade equivalent scores.

Prior et al. (2011) found that elementary school students (grades 1-5) showed better understanding of text read orally as opposed to silently; however, sixth graders were found to read with comparable comprehension across both modalities. Seventh graders demonstrated stronger comprehension of text read silently, marking the transition to more effective silent (versus oral) reading. In contrast, the sixth grade students who participated in our study were found to comprehend better after oral reading. The overall

skill level of participants may have differed somewhat across these studies. The average standard score for sixth graders who participated in the Prior et al. study was 98.28 ($SD = 9.57$) on the Reading Recognition subtest of the Peabody Individual Achievement Test-Revised (PIAT-R; Markwardt, 1998), whereas the average standard score for participants in our study was 95.84 ($SD = 13.9$) on the TOWRE-2. Our students are also from predominantly low socioeconomic status families ($\approx 59\%$ free or reduced cost lunch), whereas the students who participated in Prior et al.'s study may have been from more affluent families (79% of parents had some form of post-secondary education).

Just as there is a dearth in the literature regarding reading modality and comprehension for students in late elementary and middle school, there is also limited information about the influence of reading skill level on this relation. Reading skill was not examined in the Hale et al. (2007) or Prior et al. (2011) studies. Others have found an interaction between reading modality and reading skill in elementary students when reading connected text (i.e., Miller & Smith, 1985), but not when reading at the sentence level (Juel & Holmes, 1981). We were somewhat surprised to not find an effect for reading skill as measured by the TOWRE-2 on reading comprehension either directly or as a moderator. There are at least two possible explanations for this finding. The TOWRE-2 is a measure of word reading fluency, and it was selected because of its close relation with other basic reading skills, particularly text reading fluency, which served as an independent variable. However, lower level reading skills that are essential in the early stages of reading, such as decoding, word reading, and reading fluency, contribute less to reading comprehension as students mature and learn to use prior knowledge, draw inferences, and make abstractions to construct meaning from more complex text (Denton

et al., 2011; Floyd, Meisinger, Gregg, & Keith, 2012; Francis et al., 2006; Vellutino, Tunmer, Jaccard, & Chen, 2007). Therefore, in sixth grade students, it may not be surprising that students grouped based on their word reading fluency may not differ in terms of their reading comprehension.

Another potential explanation for this finding relates to our sample characteristics. According to the criteria used by the QRI-5, students reading text at an independent level should be able to answer 90% of the comprehension questions correctly (7.3/8), students reading at an instructional level should answer 70% of the questions correctly (5.6/8), and those at a frustration level should answer less than 70% of the questions correctly (Leslie & Caldwell, 2011). Using this criterion, on average, students fell below the standard for instructional text when reading orally or silently, suggesting that the readers in our study struggled with comprehending the passages. Perhaps reading skill would have been more influential if skilled readers were better represented in the sample. With that being said, many of our public schools consist of at-risk populations similar to the one used in this study.

During the first few years of elementary school, the curriculum is largely focused on teaching students how to read. However, around the fourth grade, students are expected to begin using their proficient reading skills to learn content area knowledge (Chall, 1983, 1996). Chall termed this transition as the reading for learning the new stage of reading development, and it corresponds to a precipitous shift in the curriculum towards reading greater levels of expository text (Kuhn & Stahl, 2003). The Common Core State Standards Initiative recommends that fourth graders spend 50% of their time reading informational text (National Governors Association Center for Best Practices &

Council of Chief State School Officers, 2010). The shift from efficient oral to silent reading fluency has also been hypothesized to occur during this period, although the actual timing of this shift is not clear based on the extant literature (Prior & Welling, 2001). In order to successfully navigate the middle school curriculum, students must be able to be independent silent readers who are able to construct meaning from both narrative and expository texts. However, our results indicate that many students enter middle school without the literacy skills they need to be successful.

Almost all students in the United States can “read” by the time that they reach third grade, if reading is defined as proficiency in basic procedural word-reading skills (Reardon, Valentino, & Shores, 2012). Teachers often report a fourth-grade slump, which can be described as the decline between third and fourth grade national reading scores (Chall & Jacobs, 2003). The fourth grade slump is particularly prevalent for students from low socioeconomic status or English as a second language families. Although the vast majority of readers in the primary grades can manage simple texts, many students struggle in the fourth grade when they must tackle more advanced, academic texts (Hirsch, 2003). Reading skill development is represented in the Common Core State Standards Initiative for fifth grade students (e.g., students should be able to read with sufficient accuracy and fluency to support comprehension, read grade-level text with purpose and understanding, etc.) (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010). However, the Common Core does not provide reading skill development information for sixth grade. Additionally, the Common Core Standards provide minimal guidance on how to support the many students who struggle with grade-level texts (Hiebert, 2014). The expectation for independent

silent reading is implicit in the Common Core Standards for late elementary and middle school students, yet only about a third of U.S. students in middle school possess the competencies necessary to read in a deeper, more comprehensive manner (Reardon et al., 2012). Most students' reading comprehension scores remain low despite many years of concerted efforts to improve reading instruction (Hirsch, 2003). In addition to learning strategies for comprehending increasingly complex, often expository text, students may also require additional pedagogical support transitioning from effective oral to silent reading during the late elementary and middle school years.

Specific reading interventions exist that target silent reading. One such approach is Scaffolded Silent Reading (ScSR; Reutzel, Jones, & Newman, 2010), which was developed in part to address the weaknesses associated with silent sustained reading (SSR). Although silent sustained reading is a prevalent classroom practice, it is not well supported by research (National Reading Panel, 2000). Results from investigations of Scaffolded Silent Reading suggests that silent reading programs can be effective if the teacher makes several proactive decisions, including structuring, guiding, teaching, interacting with, monitoring, and holding students accountable for time spent reading independently and silently (Reutzel, et al., 2008; Reutzel, Petscher et al., 2012).

Limitations and Future Directions

Several limitations and future directions of this work warrant discussion. First, our sample consisted primarily of at-risk readers. It is important that future studies have a sufficient sample of readers at all levels, including skilled readers, in order to further explore the potential influence of reading skill on reading comprehension across texts read orally and silently. The current study examined only a single grade level. Future

studies may wish to examine the relation of oral and silent reading fluency to comprehension across grade levels to better depict grade-level trends. In addition, only one reading passage was used to assess each modality due to concerns about fatigue effects. Future studies could use multiple passages for each reading modality to increase the reliability of the comprehension variables. It is notable that most reading comprehension measures involve silent reading, and our results suggest that this is where students are struggling the most. Future research could examine whether the use of oral versus silent reading comprehension assessments contribute to the fourth grade slump phenomenon.

Conclusion

As students enter middle school, they are expected to silently read text and gain content area knowledge in an independent manner. Participants in this study were found to comprehend better after oral as compared to silent reading, but struggled with comprehending texts across both modalities. Results from this work suggest that many middle school students lack the basic skills necessary to benefit fully from the curriculum, and that students may require additional pedagogical support in developing proficiency with silent reading.

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Table 1

Analysis of Variance for Reading Comprehension (N = 74)

Source	Type III Sum of Squares	df	Mean Square	F	p	η^2
Between-Subjects						
Intercept	2900.335	1	2900.335	562.506	.000	.887
Skill	11.903	1	11.903	2.308	.133	.031
Error	371.239	71	5.156			
Within-Subjects						
Modality	36.346	1	36.346	13.631	.000	.159
Modality*Skill	2.454	1	2.454	.920	.341	.013
Error	191.985	71	2.666			

Table 2

Descriptive Statistics for the Dependent Variable

	Oral		Silent	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Normal (n = 49)	5.37	1.764	4.59	1.989
At Risk (n = 25)	5.04	2.189	3.72	2.132

Note: Normal readers defined as TOWRE-2 Total Reading Efficiency standard scores \geq 90, at-risk defined as standard scores $<$ 90.

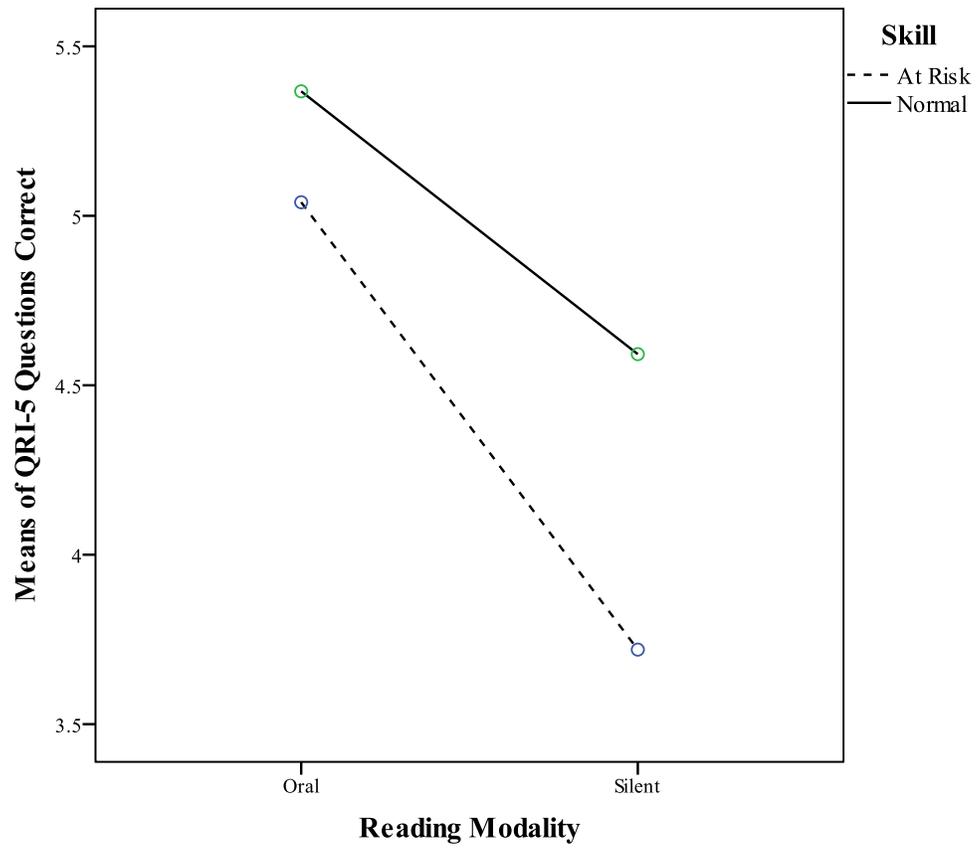


Figure 1. Means for Normal vs. At-Risk Readers

Appendix A

Oral Reading Instructions

I am going to give you a reading passage. When I say begin, I want you to read the passage **out loud** as carefully and as quickly as you can. If you come to a word that you don't know, do your best and keep going.

When you have finished reading, I will take up the passage and ask you some questions about what you just read. I cannot give you any hints or help. Do your best to answer each question correctly. Do you have any questions? Ok, here is the passage (*examiner places the passage in front of the student*). Remember to read the passage **out loud**. The title of the passage is _____. Begin reading here (*examiner points to the first word of the passage*).

Silent Reading Instructions

I am going to give you a reading passage. When I say begin, I want you to read the passage **silently** or "**in your head**" as carefully and as quickly as you can. If you come to a word that you don't know, do your best and keep going. Only read the passage through once.

When you have finished reading the passage, look up at me, and say, "**Done.**" I will take up the passage and ask you some questions about what you just read. I cannot give you any hints or help. Do your best to answer each question correctly. Do you have any questions? Ok, here is the passage (*examiner places the passage in front of the student*). Remember to read the passage **silently**. The title of the passage is _____. Begin reading here (*examiner points to the first word of the passage*).

If the child begins reading orally, provide prompt, "Remember to read in your head."