



*education sciences*

# Reading Fluency

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Edited by  
Timothy Rasinski, William Rupley, David Paige and Chase Young

Printed Edition of the Special Issue Published in *Education Sciences*

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Editors

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## About the Editors

**Timothy Rasinski** is a professor of literacy education at Kent State University and director of its award-winning reading clinic. He also holds the Rebecca Tolle and Burton W. Gorman Endowed Chair in Educational Leadership. Tim has written over 200 articles and has authored, co-authored or edited over 50 books or curriculum programs on reading education. He is author of best-selling books on reading fluency, *The Fluent Reader* and *The Megabook of Fluency*. Tim's scholarly interests include reading fluency and word study, reading in the elementary and middle grades, and readers who struggle. His research on reading has been cited by the National Reading Panel and has been published in journals such as *Reading Research Quarterly*, *The Reading Teacher*, *Reading Psychology*, and *The Journal of Educational Research*. Tim is the first author of the fluency chapter for the *Handbook of Reading Research, Volume IV*.

Tim served a three-year term on the Board of Directors of the International Reading Association and was co-editor of *The Reading Teacher*, the world's most widely read journal of literacy education. He has also served as co-editor of the *Journal of Literacy Research*. Rasinski is former president of the College Reading Association and he has won the A. B. Herr and Laureate Awards from the College Reading Association for his scholarly contributions to literacy education. In 2010 Tim was elected to the International Reading Hall of Fame. Prior to coming to Kent State, Tim taught literacy education at the University of Georgia. He taught for several years as an elementary and middle school classroom and Title I teacher in Omaha, Nebraska.

Professional development areas of expertise:

- Working with struggling readers;
- Developing foundational reading skills in young readers;
- Effective teaching of phonics and word study;
- Teaching fluency: The neglected but critical goal of the reading curriculum;
- Parental involvement in reading.

**William Rupley** is a professor in the Department of Teaching, Learning and Culture, College of Education and Human Development, Texas A&M University. Dr. Rupley is also the Editor-in-Chief of *Reading Psychology: An International Journal* and has authored or coauthored/coedited more than 15 books. He has published more than 150 articles and columns in research journals that include *Reading Research and Instruction*, *Peabody Journal of Education*, *Journal of Research in Education*, *Scientific Studies in Reading*, *Reading and Writing*, *The Reading Teacher*, *Journal of Literacy Research and Instruction*, and *Reading and Writing Quarterly*. Dr. Rupley's primary areas of expertise are reading acquisition, reading comprehension, reading in science and mathematics, and teacher effectiveness. He has been either the PI or Co-PI for over USD 3 million in federal and state funded grants.

**David Paige** is an Associate Professor of Literacy and Director of the Jerry L. Johns Literacy Clinic at Northern Illinois University. After a 20-year business career, Dr. Paige became a middle school special education teacher. After receiving his doctorate at the University of Memphis, Dr. Paige accepted a tenure-track position at Bellarmine University in Louisville, KY. During his 12 years at Bellarmine, Dr. Paige was a principle in the Bellarmine Literacy Project (BLP), a USD 3.2 million project begun by the Jefferson County Public School District that trained 800 teachers in the knowledge and strategies necessary to improve K-3 reading instruction.



Dr. Paige is also founder of the Thinking Schools Academy, an initiative in India that has trained 1200 teachers across nine states from Kerala to Assam in instructional strategies to encourage collaboration, problem-solving, and higher-order thinking in students. This work occurred over 9 years and involved 14 trips to India.

Dr. Paige has consulted with school districts, states, and non-profit organizations across the country on efforts to improve literacy instruction. These organizations include the states of Tennessee, Hawaii, and Louisiana, Student Achievement Partners, and the Northwest Educational Association (makers of the MAP assessment). Dr. Paige has also spoken at numerous state and national conferences. During the period 2016–2017, Dr. Paige was President of the Association of Literacy Educators and Researchers (ALER), a national professional organization for university researchers and educators. As a literacy researcher, Dr. Paige has published some 50 studies and articles in many of the top literacy journals including the *Journal of Educational Research*, *Journal of Literacy Research*, *Reading Psychology*, *Reading and Writing*, *Journal of Research in Reading* (UK), *Reading Teacher*, *Journal of Adult and Adolescent Literacy*, *Literacy Research and Instruction*, *Education Science*, and the *Journal of Educational Research Online* (Germany).

**Chase Young** is an Associate Professor and director of the doctorate in Literacy in the School of Teaching and Learning at Sam Houston State University. He earned his PhD in Reading Education from the University of North Texas in 2012. Previously, he was the Silverman Endowed Chair of Literacy at Texas A&M University in Corpus Christi where he was also selected as one of Corpus Christi's 40 Under 40 for his work with young readers in the community. His research primarily aims to develop reading fluency and support struggling readers in elementary school. In 2014, the ALER selected him as their Jerry Johns Promising Researcher. His research has appeared in *The Journal of Educational Research*, *Journal of Research in Reading*, *Reading Psychology*, *Reading Teacher*, *Journal of Adolescent and Adult Literacy*, and *Literacy Research and Instruction*. Along with Timothy Rasinski, he recently coauthored *Tiered Fluency Instruction: Supporting Diverse Learners in Grades 2–5*. He is currently an editor of *Literacy Research and Instruction* and previously served as editor of the *Journal of Teacher Action Research* and the *Texas Journal of Literacy Education*. Before entering higher education, he taught elementary school and served as a reading specialist.

# Preface to “Reading Fluency”

In 1983, an influential article appeared in the journal *The Reading Teacher*, by Richard Allington, entitled “Fluency: The Neglected Reading Goal.” In this piece, Allington argued that reading fluency was a critical variable for reading success, yet it is often ignored in reading curricula. He wrote, “A lack of fluency in oral reading is often noted as a characteristic of poor readers, but it is seldom treated” (Allington, 1983, p. 556). This article raised awareness of the importance of reading fluency to the reading research and instructional communities. Indeed, the Report of the National Reading Panel (2000) verified that fluency was one of the essential competencies for proficiency in reading. Research since then and until now continues to demonstrate the importance of fluency in competent reading.

However, despite the growing recognition of reading fluency, it continues to be misunderstood, and in some cases, a neglected component of the reading curricula. Some interpretations of fluency are that it is only concerns oral reading, or that it should focus on making students read quickly, that is only about word recognition, or that it is only a competency that is important for beginner readers. As a result of these as well as other misconceptions about fluency, it remains an enigma for models of reading and reading instruction. One study found that in elementary schools that were committed to make reading fluency an essential component of reading instruction, less than 5 minutes per day was devoted to fluency instruction and nurturance.

Clearly, the need for fluency to be a topic of serious thought and discussion in the literacy community continues. With this volume, we hope to advance this important discussion. The chapters in this volume, written by authors who have extensive experience in the study of reading fluency, examine reading fluency from a variety of perspectives. The initial chapter sketches the history of fluency as a literacy instruction component. The following chapters examine recent studies and approaches to reading fluency, followed by chapters that explore actual fluency instruction models and the impact of fluency instruction. The assessment of reading fluency is critical for monitoring progress and identifying students in need of intervention. Two articles focus on assessment, one on word recognition and the other on prosody, expanding our understanding of fluency measurement. Finally, a study from Turkey explores the relationship of various reading competencies, including fluency, in an integrated model of reading. Our desire for this volume is that it sparks a continuing interest in research into reading fluency and fluency instruction. The best outcome is that we move forward in making fluency instruction an integral part of all literacy instruction.

Given that reading achievement in the United States and other countries has been stagnant for over two decades, and that during the same time period fluency instruction has been, at best, a tangential component of reading curricula in general, it seems prudent that fluency be neglected no longer. With this volume, we hope that your understanding, valuing of, and commitment to reading fluency for effective literacy instruction will be renewed.

Allington, R.L. (1983). Fluency: The neglected reading goal. *The Reading Teacher* 36: 556–61.

National Reading Panel. (2000). *Report of the National Reading Panel: Teaching Children to Read. Report of the Subgroups*. Washington, DC: U.S. Department of Health and Human Services, National Institutes of Health.

**Timothy Rasinski, William Rupley, David Paige, Chase Young**  
*Editors*





Article

# Fluency: Deep Roots in Reading Instruction

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**Abstract:** Over the past two decades, reading fluency has been increasingly recognized as an important instructional variable for success in reading. Yet, this has not always been the case. This article presents a historical review of the nature and role of fluency instruction in the United States. The roots of oral reading fluency began in an age when texts and other forms of entertainment and information were limited. Historically, in America, oral reading was the predominant means for conveying ideas and passing the time at home with the family. In the 1800s, American education's primary method of instruction emphasized the need for being able to read aloud with expression and fluency, in order to hold the listeners' attention and convey information. As texts and other forms of information became more available, oral reading became deemphasized, and silent reading was viewed as a better approach to developing readers' comprehension at the cost of fluency development. With continued research and national reports that indicate the significant contributions of oral reading fluency to reading comprehension and academic proficiency, it is clear that the roots of oral reading run deep, and that fluent reading development is important to learners' academic achievement and reading comprehension.

**Keywords:** reading fluency; oral reading; academic achievement; comprehension

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## 1. Introduction

Inasmuch as reading fluency has been identified in the United States by the National Reading Panel as a critical competency test for proficiency in reading, yet has often been neglected and misunderstood in the reading curriculum, a review of the history of fluency is in order. In this essay, we provide an historical overview of the nature and role of reading fluency instruction in the United States.

The roots of reading fluency are embedded in oral reading. Early in American education, oral reading played a dominant role both in and out of the classroom. In many American homes there was often only one person who could read, and the supply of books found in these early American homes was limited [1,2]. Thus, oral reading was a primary form of entertainment, and if others were to either enjoy a book or learn from text, it had to be read aloud. As a result of its main role as a means of both entertainment and sharing knowledge, oral reading was the focus of United States classroom instruction [1].

Many of the earliest textbooks for teaching reading identified oral reading as the major procedure for instruction [3,4]. Not only was reading aloud a goal of reading instruction, but oral reading had to be done eloquently [2]. This goal, of effectively communicating through oral reading, placed an emphasis on reading "with feeling" and conveying meaning. The following excerpt is from a text

used to teach reading during this time period, and it clearly illustrates this emphasis. "A just delivery consists in a distinct articulation of words pronounced in proper tones, suitably varied to the sense, and the emotions of the mind . . . and the whole accompanied with expressive looks, and significant gestures . . ." (Lyman Cobb, cited in [2]).

Reading aloud was also a resource necessity at the time. In order to maximize reading instruction in classrooms that had a limited supply of texts, schools began to use a form of oral reading that focused on the features of diction, which included articulation, pronunciation, delivery and vocalization. Thus, oral reading was viewed as both the preferred method and the goal of reading instruction [5,6]. The recitation lesson usually involved the teacher modeling the oral reading of a text followed by the students orally practicing the passage on their own. Then after a sufficient period of practice, the students orally read or recited the passage for the teacher and fellow students. Students' reading was evaluated by their teacher on the quality of their recitation and recall of what they read. Hoffman [6] noted that such an approach to reading instruction was referred to as the "story method", because the focus was on a complete text.

In the preface for parents in *Young Years: Best Loved Stories and Poems for Little Children*, Augusta Baker [7] shares the following excerpt from Mary Ellen Chase's recollection of her earliest memories of being read to by her mother in an old Maine farmhouse while sitting in the sunny kitchen around the large black wood stove in the late 1800s.

My mother usually somehow managed, at eleven, to sit down for half an hour in the red rocking-chair by the window. She called this half hour her "respite," a word which early charmed me; and on days when no drafts were blowing across the floor (for even The Rising Sun was not always victorious over the worst of Maine weather) she would help us down from our Parnassus (the old secretary) and allow us to sit upon our red stools while, our cookies and milk consumed, she herself would read aloud to us. Here was the very doorsill to complete enchantment, for she was seemingly as lost as we in whatever she was reading . . . . There was always the excitement of our father's coming home at noon . . . He was always interested, as he lifted us down from the secretary, in what we had been reading; and . . . . he would sometimes promise to go on that evening with an especial book, reading to us himself by the living room fire while my mother, as avid a listener as we, would darn the countless socks and patch the red flannel underwear. (p. X)

By the beginning of the 20th century, it was apparent that oral reading had become such a deep-rooted and entrenched part of American life and learning that the philosopher William James [8], as cited in Hoffman and Segel, [5] pointed out that ". . . success or failure in teaching reading is based, so far as the public estimate is concerned, upon the oral reading method".

## 2. Oral Reading Decline

Oral reading as the mainstay of teaching reading began to be questioned at the beginning of the 20th century [1]. Scholars in Europe and the United States believed that reading orally gave too much attention to an oral rendition of text, and too little attention to actually focusing on the meaning of the passage [1]. Many educators felt that reading instruction was more about successful pronunciation and speech rather than connecting emotionally and cognitively with what was being read. Horace Mann [9] claimed that "... more than eleven-twelfths of all the children in reading classes do not understand the meaning for the words they read".

Embedded within the issue of a need to focus on reading for meaning was the fact that reading materials were now becoming more easily accessible, thus there was less of a need for oral reading at both school and home. Reading silently became more common in the family, workplace and community. As a result, the argument was put forth that schools should abandon oral reading and teach silent reading, which was in-line with the preferred form of reading for adults during this time period.

As the role of reading in society grew, science and scientific inquiry began to have an impact on reading education. Reading scholars, such as Edmund Huey [10], argued that oral reading was a task of importance only in schools, and silent reading predominated throughout society. The focus was on constructing meaning from text, and silent reading should be the method of teaching comprehension to the students. Further, during the early 1900s, books, magazines, newspapers and other reading materials were available for adults and children to read, and the numbers were expanding rapidly [1]. Silent reading was deemed more efficient than oral reading as a means to take advantage of and cover this growing body of print; therefore, silent reading needed to be emphasized in reading instruction. In their series of instructional reading books, Buswell and Wheeler [11] noted that reading instruction in schools where oral reading was the form of instruction used very few reading materials, which was a major contrast to settings outside of school.

Thus, silent reading began to replace oral reading as the preferred mode of reading for instruction. Scholars felt that silent reading was a more authentic form of reading; for most readers in the real world, silent reading dominated oral reading. Silent reading focused readers' attention on the texts' meaning, while instruction in oral reading tended to focus attention on accurate word identification, pronunciation and recitation of the text. Silent reading was also felt to increase all students' engagement in reading, and this increased motivation to read would allow students to develop an understanding of the text with the first and only reading. Moreover, in oral recitation reading activities, only one student read at a time, while the remaining students served as an audience for the reader and were often considered to be off-task and not engaged in reading instruction. Reading volume in the oral reading model was necessarily limited, and by eliminating the need to read one text with the goal of expressiveness, silent reading facilitated the reading of many texts for meaning and learning, and became the preferred method of reading instruction [5].

### **3. Scientific Study of Reading**

Occurring concomitantly in the early 20th century were scientists' attempts to identify and study the basic events and components within their fields—chemists and physicists studied basic elements of nature, biologists studied the cell and its component, and many educational psychologists studied reading development. These reading scholars began to look at word frequencies in texts and the decodability of words that comprised texts. As a result of their studies, what children were taught to read became contrived passages. Passages that contained basically high frequency and easily decodable words were taught through repetition, and were intended to be recognized holistically and instantly when encountered by readers [12].

By the 1920s silent reading became the mode of instruction, and Chicago schools in the 1930s and 1940s adopted the non-oral method of reading instruction, which taught students to directly gain meaning from text, and involved only the eyes and the central nervous system [13,14]. In this program, silent reading that involved internal sounding of words was discouraged. Although severely criticized [14] and eventually abandoned, the emergence of the non-oral method demonstrated the magnitude at which reading orally was seen as unnecessary and detrimental in learning to read.

The demise of oral reading as a goal for reading instruction in the 20th century and a call for a prominence of silent reading and comprehension did not lead to the desertion of oral reading as an instructional practice. Austin and Morrison [15] reported that their investigation of classroom reading instruction brought to light that oral reading continued as a mainstay. Oral reading continued throughout the latter half of the 20th century as a dominant practice. Reading aloud was used primarily as a method of checking students' word recognition after silent reading [16]. This change in the use of oral reading, from reading for fluent expression that conveyed meaning to reading for checking for word recognition, became the genesis of round-robin oral reading. Furthermore, this approach to reading assessment was integrated into the basal reading programs that assumed the preeminent position in elementary reading instruction from the early 1950s to the present [5,6].

Round-robin reading has become one of the most ubiquitous forms of reading in American reading instruction. In the original form of round-robin reading, students read orally for a teacher who, rather than coaching students on their individual oral reading performances, made note of and corrected any errors that were made during the reading. In some ways, it was analogous to the oral reading portion of today's reading assessments, using informal reading inventories or reading running records. Students were given additional instruction in the words missed or on any patterns of words that presented difficulty. Despite its pervasive use [6,17], round-robin reading has never been widely advocated nor endorsed by scholars of reading [18].

Although silent reading has maintained a dominant position for scholars of reading instruction and acquisition, oral reading does play an important role in reading instruction. In her 1966 essay identifying significant reading skills for the primary grades, Dolores Durkin [19] states emphatically that, "... silent reading is what we are trying to teach at all stages of reading development and at all grade levels. Such an emphasis ... should not suggest, of course, that oral reading be eliminated from reading programs" [19], p.33.

#### **4. Oral Reading Bears the Fruits of Reading Fluency**

With the recent refocusing of the reading curriculum by the National Reading Panel [20] on a few necessary and basic components in the elementary reading curriculum, oral reading has gained considerable status. The panel has identified reading fluency as a key competency in learning to read. Moreover, the panel, much like Chall's stages of reading development [21], has endorsed oral reading as the central form for achieving reading fluency. Thus, oral reading as a means for readers to develop fluency has resurrected it as an important component of reading instruction in the 21st century.

One of the more important milestones in contemporary conceptions of reading fluency came with the publication of LaBerge and Samuels's [22] theory of automatic information processing in reading. LaBerge and Samuels believed that the processing of words in reading, such as visualizing, sounding, phrasing and so forth, should happen at an automatic level, which demands little attentional or cognitive capacity. Thus, readers can use their finite cognitive resources for the more important task in reading, which is comprehension. The theory of automaticity proposes that humans have a limited amount of attention or cognitive energy that, when applied to one task, cannot be easily applied to other tasks that require attention. The task of reading requires readers to do at least two tasks simultaneously. First, readers decode the words they encounter in their reading, and second, they must construct meaning from the decoded words. If readers have to use too much cognitive energy to decode the words in the text, even if those words are read correctly, they may not have sufficient cognitive resources available to comprehend. LaBerge and Samuels hypothesized that, for many readers, poor comprehension could be explained by readers who had to invest too much of their cognitive resources in the surface-level aspects of reading, namely the slow, laborious, conscious-filled decoding of words. This investment of resources into the surface-level component of reading depleted or exhausted cognitive resources available for making sense of what they read.

Jay Samuels [23] put the theory of automatic information processing in reading to the test and hypothesized that automaticity finds its way into many human activities, particularly those of athletes and musicians. Athletes and musicians are well known to have developed certain skills to a level where they can be performed automatically and seemingly without effort. Typically, they developed these skills to this automatic level by first working with a teacher or coach to develop the skills to a level of conscious mastery. Then, they practiced such skills until they became automatic in their execution. The repeated practice that was often found in 19th century oral reading instruction seemed to be the key to the development of fluency.

Samuels then asked, how do teachers normally teach reading? He reasoned that for many students, especially those with difficulty in learning to read, the teacher tended to cover the reading curriculum at a pace that was too fast for such readers to develop conscious mastery of accuracy or automaticity in critical reading skills. Samuels tested his ideas with a group of mentally handicapped students.

He asked students to read short passages, of approximately 250 words in length, repeatedly until they achieved a reading speed of 95 words per minute. Samuels explained to the students that, like basketball players who need to repeatedly practice plays to develop their ability to execute plays, readers need to practice reading a passage until they can read it with fluency. The method of repeated readings led to improvements in passage reading accuracy, speed and expression. Samuels also discovered that, when moving to reading new texts, students' initial readings were better than their initial readings of the earlier passages. Furthermore, the number of repeated readings required to reach the criterion reading rate fell over time. Samuels explained his findings in terms of automatic information processing in reading. He argued that through their repeated readings (practice), readers were developing automaticity in word decoding and word processing, and this automaticity was generalized to new passages. Thus, fluency improvement was not limited to what the students were practicing, but was applied to new, never-before-read passages as well.

Carol Chomsky [24], during the same time period, was testing a method for improving reading that involved repeated reading integrated with an approach developed by Heckelman [25], referred to as the Neurological Impress Method [26–28]. Chomsky had struggling readers repeatedly read texts while simultaneously listening to a fluently read audiotaped version of the same text. The reading and listening were repeated until students felt that they could read the text fluently. Similar to Samuels, Chomsky reported remarkably positive results for students on text practices and on new texts never before read.

Stanovich [29] proposed a theory he termed the “interactive compensatory explanation” of reading fluency. He hypothesized that struggling readers were less able than competent readers to use automatic, attention-free, bottom-up text processes in decoding. Rather, they compensated by employing more context-bound strategies that required significant amounts of cognitive resources for word decoding. In doing so, they had fewer cognitive resources available for comprehension. These readers are characterized by slow, laborious, monotone and unenthusiastic oral readings. Good readers, on the other hand, are quite able to use automatic, attention-free, bottom-up processes for word decoding, and thus reserve their limited top-down, contextually dependent processes for comprehending what they read. These readers are characterized by accurate and nearly effortless oral word reading with appropriate phrasing and expression.

Schreiber and Read [30–32] argued that through practice students were developing a greater awareness of the prosodic features of oral reading and speech. That is, they were learning to embed in their reading the expressive and intonational features of oral speech that help to mark phrase boundaries within and between sentences and convey meaning. Dysfluent readers often read in a slow, word-by-word fashion that is not conducive to the prosodic and syntactically appropriate phrased reading that results in meaning. Dysfluent readers, through their repeated practice, are better able to recognize the prosodic and syntactic features of text, which results in more effortless surface-level processing and text comprehension.

Automatic processing of the surface-level text features, and the ability to attend to the prosodic and syntactic features of text while reading, seem compelling in ultimately leading to readers who are able to comprehend text. Today, both are considered crucial components of reading fluency [33] and both are linked to comprehension of text.

Richard Allington [34] presented his concept of reading fluency, arguing that reading fluency appears to be an important aspect of the reading process that holds great promise for improving the reading performance of many struggling readers. Equally importantly, Allington also noted that the reading community had largely ignored fluency, and was probably associated with the turn of the century move away from oral reading. Allington's article initiated a revitalization of the significance of oral reading fluency, and argued for why this aspect of reading could not be ignored. A large-scale study of reading fluency [35] reported significant findings for the quality of fourth graders' oral reading and reading comprehension, and advanced the conclusion that reading fluency is an important variable in the scholarship of reading. In their study, over 1000 fourth-grade students who had taken the reading



achievement assessment for the National Assessment of Educational Progress (NAEP) orally read a brief passage. Their oral readings were qualitatively analyzed for expressiveness, phrasing, and accuracy. Students who read orally with greatest fluency tended to score highest in overall NAEP reading achievement, and less fluent readers were associated with the lowest levels of reading achievement.

In a study of struggling elementary grade readers, Rasinski & Padak [36] found that students referred for supplementary instruction in reading were more likely to manifest significant difficulties in reading fluency than in word decoding or passage comprehension. Similarly, Fuchs, Fuchs and Maxwell [37] found a remarkably strong relationship (correlation coefficient = 0.91) between measures of reading fluency and students' performance on a standardized test of silent reading comprehension.

These studies and others formed a corpus of research for a powerful and compelling relationship between reading fluency and measures of reading achievement, proficiency and comprehension. Scholars were coming to the realization that oral, expressive and automatic readings of texts were a significant contributor to overall proficiency in reading. Expressive reading was no longer important for the sake of expressive reading only; it was important because it appeared to lead to gains in reading achievement. Thus, the next step in this line of inquiry was to determine, through empirical study, if instruction in fluency would actually lead to generalized improvements in reading.

Several inquiries have examined the effect of the repeated-reading method used by Samuels [23]. In reviews of research related to repeated readings, Dowhower [38,39] reported that investigations of the repeated-reading method have shown increases in students' reading rate, word recognition accuracy and comprehension. Moreover, reading improvements transfer to unpracticed passages for students in primary through the middle grades, and repeated reading appears to be an effective intervention for students experiencing difficulty in learning to read [38,39].

Chomsky's [24] research has been extended, and studies have examined various types of assisted reading. These include pairing students to read, a struggling reader listening to a more fluent partner read with them [40–43], and reading independently while listening to an audiotaped fluent reading of the text [44–46]. Findings from these studies have generally demonstrated positive results for improving students' reading [33,47].

For most of the 20th century silent reading has held primacy in United States reading instruction. However, the National Reading Panel [20], in its review of research related to "encouraging students to read more," where the type of reading done generally was silent reading, was unable to determine a significant impact on reading achievement. Indeed, a reanalysis by Wilkinson, Wardrop and Anderson [48], of a noted study that found a positive relationship between silent reading and student reading achievement, [49] determined that there was "no persuasive evidence that silent reading had an effect on students' reading achievement" (p. 139). In fact, Wilkinson and his colleagues found that some of their data models revealed that oral reading appeared to have a greater impact on reading achievement than did silent reading.

Research by Stallings [50] with struggling secondary school students found that the amount of oral reading done in the classrooms was positively associated with gains in achievement, while the amount of silent reading was negatively correlated with achievement gains. Students in classrooms that manifested substantial gains in achievement spent upwards of 20% of their instructional time in oral reading, while students in classrooms where no gains were found spent approximately 1% of their time in oral reading.

At the very least, these studies appear to suggest that oral reading can have a positive impact on student reading achievement. The Pinnell et al. [35] study cautions that simply the amount and frequency of reading aloud in the classroom was not necessarily associated with oral reading fluency or later reading proficiency. The results from their study stimulated the authors to speculate that it is not the sheer quantity of oral reading that takes place in the classroom that improves oral reading fluency, but instead it is the type of oral reading instruction that makes a difference in student achievement.

At the very least, these findings appear to suggest that oral reading can have a positive impact on student reading achievement, a conclusion carried forward within the ensuing standards movement.

## **5. Fluency in the Age of the Standards**

In the United States, the Common Core Standards for reading have put decoding and reading fluency (called foundational skills) front and center, as essential to supporting the understanding of text [51]. Additionally, research on reading prosody, one of the three indicators of fluent reading [52], emerging over the past 15 years is suggesting its importance beyond reading with feeling.

Child development researchers have discovered that infants use lexical stress to break otherwise continuous streams of speech into individual words [53,54]. Infants later learn that not all syllables are the same, as they differ in how the speaker applies stress [55]. Evidence has emerged that the prosodic sensitivity developed in early speech is related to development of phonological awareness, and the development of word reading accuracy and spelling when children begin learning to read [56]. Wade-Wooley [57] found that readers who could correctly identify lexical stress, an element of prosody, were better at reading multi-syllabic words. While reading prosody is often neglected, its foundational role as the rhythm of speech creates a cognitive framework that is also important to understanding written language [58,59].

In order for prosodic reading to occur, the reader must integrate word, phrase and sentence-level information with semantic information [60,61]. This suggests that for a reader to generate prosodic reading, comprehension processing must simultaneously occur. In fact, researchers are finding that prosody is a significant predictor of silent reading comprehension. Studying second-grade students, Benjamin and Schwanenflugel [62] found that after controlling for reading rate and accuracy, prosody accounted for 5.5% of additional variance in reading comprehension. In a study of third-grade students, Schwanenflugel and Benjamin [63] also found that prosody predicts unique variance in comprehension beyond that of rate and accuracy. Paige et al., [64] found that prosody and word identification, not reading rate, predicted reading comprehension in early elementary grade readers, while Veenendaal, Groen and Verhoeven [65,66] found the same results in fourth-grade Dutch children. Klauda and Guthrie [67], as well as Valencia et al. [68], found that elements of prosody predicted reading comprehension in adolescent readers.

In a recent study, Rasinski et al. [69] noted that the benefits of oral reading fluency extended beyond the primary grades, and it was equally important in the academic achievement of middle and secondary students' reading performance. For example, Paige, Rasinski, Magpuri-Lavell, & Smith [70] studied ninth-grade students and found prosody predicted reading comprehension while rate did not. In the Rasinski et al. [69] study, it was shown that freshman in college who had higher oral reading fluency out-performed students with lower fluency rates on the ACT Reading and ACT Composite tests. Fluency had significant and positive correlations with these students' college entrance exam results.

To better understand the critical role of prosody, Fodor's [71] implicit prosody hypothesis suggests that good readers routinely project a prosodic contour onto what they read. However, in the case of an ambiguous or otherwise confusing phrase, the reader's default contour may be insufficient in understanding its meaning. What is left for the reader to do? A good reader may then audition several prosodic contours to determine if one is more helpful than another in resolving the ambiguity presented by the phrase. The one that becomes the best fit is adopted and the reader moves on. Paige et al. [70] referred to this use of prosody as a problem-solving strategy which, when necessary, becomes critical to comprehension.

This corpus of research evidence points to fluency, and particularly prosody, as important in reading achievement. However, in today's accountability age, when end-of-year assessments demand significant amounts of attention and test prep, does preparing students as fluent readers have a place? Does it matter?

## **6. Fluency's Relationship to Academic Achievement**

In a recent study of 1064 third-grader readers, Paige et al. [72] found that reading fluency, spelling knowledge and pseudo-word and sight-word reading were significant predictors of reading achievement on an end-of-year state reading achievement test. Of the four predictors in the study,

reading fluency was the strongest predictor, but the researchers also noticed that spelling development (a proxy for letter-sound understanding) and sight-word reading are critical sub-skills to fluency development. More surprisingly, though, the authors found that when students possessed appropriate spelling and reading fluency skills, they had a 70% likelihood of being proficient on the state reading assessment. This compared to a 20% chance of proficiency for their struggling classmates. While this result may not be surprising to reading scholars, in today's educational world where the currency for a school is percent proficiency, this is a startling finding. The moral of these results for elementary school leaders is that failing to develop fluent readers may well end poorly when it comes to accountability testing.

## 7. Conclusions

This history of oral reading and oral reading fluency in the United States began in an age when texts and other forms of entertainment and information were limited, and oral reading was the predominant means for conveying ideas and passing the time at home with the family. During those early days of American education, the instruction emphasized the need for being able to read aloud with expression and fluency that would hold listeners' attention and captivate an audience. As texts and other forms of information became more available, a switch occurred, to the belief that silent reading was the better approach to developing readers who could comprehend text, often ignoring the significance of developing reading fluency. Research and national reports indicate the significant contributions of oral reading fluency to reading comprehension and academic proficiency. Thus, the roots of oral reading are deep, and the fruit they bear in the form of fluent reading and automaticity are worthy of harvest and use in today's reading instruction. Although proficiency in silent reading continues to be an appropriate goal for reading instruction and curricula, this historical review suggests that oral reading, particularly oral reading focused on developing reading fluency, should also maintain a place in reading education.

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Review

# Fluency Interventions for Elementary Students with Reading Difficulties: A Synthesis of Research from 2000–2019

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**Abstract:** Oral reading fluency (ORF) deficits are a hallmark of reading difficulties. The impact of fluency struggles extends beyond word-level difficulties to include deficits in reading comprehension. Sixteen empirical studies conducted in 2000–2019 that examined ORF interventions among elementary students identified as having reading difficulties were reviewed to identify the characteristics (e.g., instructional variables, group size, type of interventionist) of effective ORF interventions and their impact on English oral reading fluency and reading comprehension outcomes. The systematic review revealed that interventions reported centered around repeated reading procedures (86.5%). Across the 16 studies, outcomes for oral reading fluency varied widely and most focused on speed and rate aspects rather than prosody. Effect sizes for rate and accuracy measures ranged from negligible to large (i.e., 0.01 to 1.18) and three studies found large effects for prosody outcomes. Effect sizes for reading comprehension ranged between non-significant and large significant effects. Findings support the use of repeated reading of text to build up ORF of students with reading difficulties. Interventions that were found to be most effective were those that were conducted one-on-one with a trained model of fluent word reading and accuracy. Findings also point to three gaps in our understanding: (1) the efficacy of interventions other than repeated reading, (2) effects of ORF interventions on prosody outcomes, and (3) sustainability of outcomes.

**Keywords:** interventions; oral reading fluency; reading comprehension; reading difficulties; systematic review

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## 1. Introduction

According to the most recent scores from the National Assessment of Educational Progress (NAEP), a significant number of fourth- and eighth-grade students in the United States (U.S.) are failing to read at satisfactory levels [1]. Specifically, 32% of all fourth-grade students were found to be reading below basic levels, demonstrating difficulties with making simple inferences and finding relevant information to support their understanding of a text. This statistic sees an alarming increase among students identified as having learning disabilities, with 68% of struggling fourth graders reading below basic levels. This is hardly surprising considering that difficulties with reading are commonplace among students identified with learning disabilities [2].

Chall's stages of reading highlight the importance of oral reading fluency as students' decoding develops. Proficient oral reading fluency is one of the main characteristics identifying children moving from stage 2 (learning to read) where the focus is on rapid decoding of words to stage 3 (reading to learn) where students begin to gain new knowledge and ideas through their reading of increasingly complex texts from a variety of different genres [3]. Based on Chall's model, fourth graders should be entering the reading-to-learn phase (stage 3). However, findings of students reading below basic



levels in the fourth grade on the NAEP suggest that many fourth graders in the U.S. have not entered this phase and are still working to master learning to read. Students' difficulties with oral reading fluency may thus be one factor prohibiting students from progressing to the more advanced stages of reading development [3]. This theoretical proposition is well supported in research conducted among students in the U.S. For instance, Daane, Campbell, Grigg, Goodman, and Oranje examined a subsample of fourth-grade students who took the NAEP reading assessment in 2002 and identified 40% of the sample to be "non-fluent" readers who also scored at or below the basic achievement level on the overall NAEP reading assessment [4]. The negative impact of deficits in oral reading fluency extends to many other school subjects that require students to gain understanding through reading [5], further underscoring the importance of oral reading fluency for reading development. Beyond the U.S. context, the importance of fluency for reading is also evident in that reading curricula standards across different countries and languages cite the achievement of fluency in reading words and texts, typically by grade three, as a curricula goal [6]. Deficits in automaticity in reading have also been found to be associated with children identified as having reading disabilities across a range of languages [7,8].

Therefore, in light of the far-reaching effects of difficulties in reading fluency and that fluency is identified as a crucial building block of reading development [5,9], it is essential that fluency interventions be provided for elementary students demonstrating difficulties in reading [5]. An increase in oral reading fluency skills would allow students to read more complex text at more proficient levels. Thus, this synthesis of research will examine the types of interventions which aim to build the oral reading fluency and their impact on reading outcomes in students with reading difficulties.

### *1.1. Oral Reading Fluency*

Fluent reading is often conceptualized as being synonymous with three aspects, namely, the ability to read texts with accuracy, appropriate rate, and prosody [10], with the ultimate aim of extracting meaning in reading [11]. The multifaceted nature of fluency and the association between fluency and reading comprehension is well-placed in theory and empirical research [11–14]. For one, how rate and accuracy components in reading fluency facilitate reading comprehension is outlined in the model of automatic processing [15]. According to this model, all individuals have limited cognitive capacity which makes it necessary for readers to develop automaticity in lower-level word recognition skills such as grapheme–phoneme correspondences and phonemic awareness in order to dedicate adequate cognitive resources to higher-order tasks involving comprehension of texts [15]. This ability to develop automaticity in word recognition processes is what often differentiates fluent from dysfluent readers. Dysfluent readers likely find their cognitive attention consumed primarily by decoding as they have to intently and laboriously attend to letters, sound-symbol correspondences, and word recognition. The inability to achieve automaticity in lower-order processing places large demands on working memory, leaving few resources available to negotiate meaning making in texts. Considering the centrality of working memory in facilitating the storage and retrieval of information in texts during the process of reading for comprehension [16,17], non-automaticity in decoding hinders reading comprehension [18].

It has also been suggested that fluency aspects of accuracy and rate mediates the association between decoding and reading comprehension, a postulation that has been empirically supported. Silverman, Speece, Haring, and Ritchey measured the contributions of aspects of decoding comprising phonological awareness, word and nonword reading as well as fluency (measured by speed and accuracy in reading words, sentences, and texts) in reading comprehension, controlling for linguistic comprehension [19]. They found that when fluency aspects were not included in the model, there was a significant relation between decoding and reading comprehension. However, this relation was no longer apparent once fluency was accounted for. In addition, students who were good decoders but non-fluent readers were weaker in reading comprehension as compared to those with strong decoding and fluency skills [19]. The finding in Silverman et al. that good decoders could be further classified as fluent or dysfluent readers also supports that of previous research, suggesting that although there

is a strong association between decoding and fluency [20,21], proficiency in the former does not automatically translate into the latter. Rather, explicit instruction that builds up fluency is necessary to facilitate the transition from being able to recognize words accurately to being able to recognize words both accurately and rapidly [19].

The role of prosody in reading comprehension has also been established, although to a lesser extent than accuracy and rate aspects. Prosody, a frequently overlooked component of oral reading fluency [22], is concerned with reading with expression and is associated with the ability to produce appropriate changes in pitch and stress as well as use appropriate phrasing and intonation [14]. Prosodic elements are suggested to be central components of fluency and reading comprehension because reading words in meaningful phrases allows readers to focus on the ideas in the text and students who read without expression are likely not gaining full meaning of texts [9,23]. Empirical research supports this view. For instance, in a study examining the relationship between prosody and reading comprehension in 80 third-grade students [24], students read aloud a passage which targeted specific characteristics of prosodic reading, including (1) basic declarative sentences thought to elicit a decline in pitch, (2) basic quotes intended to elicit pauses in phrasing, (3) yes/no questions designed to elicit an increase in pitch, and (4) phrase-final commas thought to elicit pauses in phrasing. Findings showed that children who demonstrated greater prosodic awareness, where they showed a decline in pitch in declarative sentences and an ascent in pitch with yes/no questions, had higher reading comprehension scores as those who did not.

### *1.2. Oral Reading Fluency and Reading Difficulties*

Increasingly, deficits in reading fluency have been acknowledged as an area in which children with reading disabilities struggle [20,25]. This is evident in that oral reading fluency was added to the federal definition of a specific learning disability through the Individuals with Disabilities Education Improvement Act (IDEA) in 2004 [26]. Scientific studies of reading also support this view. For instance, as evidenced in Daane et al. [4], many students with reading difficulties were dysfluent readers who read slowly and laboriously. These students often struggled with automatic word recognition and had to stop frequently while reading to sound out words or use structural analysis to look for common syllable types or morphemes [27]. In another study, Rasinski and Padak examined the word recognition, oral reading fluency, and reading comprehension abilities of 604 students in second through sixth grade identified as having reading difficulties [28]. After collecting data from an informal reading assessment (Ekwall Reading Inventory) and routine assessments given by teachers, Rasinski and Padak concluded that difficulties with reading speed translated into fluency deficits that negatively impacted reading comprehension [28]. In another recent study, Kang and Shin concluded that an estimated 6% of struggling readers in upper elementary grades exhibited early reading difficulties related to decoding and fluency [29]. Moreover, when combined with students who had issues with basic reading skills, as well as comprehension, more than half of all struggling readers in upper elementary grades displayed deficits in decoding and fluency skills. Their work emphasized that fluency is, in fact, an essential component of reading comprehension, and that fluency, while it overlaps with decoding, is a separate component that makes unique contributions to reading comprehension.

In light of the evidence suggesting the crucial role fluency plays in reading, especially among children with reading disabilities, researchers have pointed to the importance of interventions targeted at raising students' fluency skills. Specifically, researchers have emphasized the need for interventions to target fluency aspects directly rather than indirectly through other related reading skills such as phonological awareness because interventions of the latter nature alone have not been shown to improve fluency skills [5,12,30]. Researchers have put forth that fluency improvements increase reading comprehension among struggling readers indirectly by freeing up limited working memory resources to be used in higher-order processes in reading [15,31,32]. This explanation is tenable considering that research has shown that children with reading difficulties often exhibit working memory deficits, see [33] for a review.

However, fluency instruction is often absent from elementary school reading curriculum today, possibly because classroom teachers are rarely provided with any training on instructional strategies to promote oral reading fluency [34]. This lack of attention to fluency in instruction and the consideration that fluency is a skill that has been identified to be difficult to build up points to the importance of examining the efficacy of direct interventions of fluency [35,36]. In addition, considering the close association between fluency and reading comprehension, examining the efficacy of fluency interventions on reading comprehension in addition to fluency outcomes is necessary. In general, previous syntheses and meta-analyses that have examined children with reading disabilities have shown oral reading fluency interventions to be effective in improving fluency and/or comprehension outcomes in school-aged children [37–39]. Across these reviews, researchers have also highlighted the importance of considering characteristics including type of intervention, type of interventionist (adult vs. peer), number of times texts were read in the interventions, pre-instructional support, corrective feedback, and number of elements included in interventions in order to assess intervention effectiveness [37–39], although these have not been systematically examined among children with reading difficulties across reviews. For instance, the systematic review conducted by Therrien found considerable effect sizes associated with fluency interventions on fluency and comprehension outcomes for students with and without learning disabilities (LD) and highlighted that interventions that were conducted by an adult typically yielded greater effect sizes as compared to those mediated by peers [39]. However, the review focused solely on repeated reading interventions and did not consider the effects of other types of interventions. In addition, the characteristics of interventions and their effectiveness on reading outcomes for LD children specifically were not discussed. Similarly, only repeated reading interventions were examined in a more recent meta-analysis conducted by Lee and Yoon and the effects of interventions on fluency outcomes only were examined. Transfer effects of fluency to reading comprehension outcomes were not examined [37]. Furthermore, although the review conducted by Chard et al. discussed in detail intervention characteristics related to different fluency interventions and the effects of interventions on both fluency and comprehension outcomes, effect sizes across studies reviewed were not reported [38]. In addition, the number of studies reviewed pertaining to the different intervention characteristics were very small, making it difficult to draw definite conclusions from these studies. Finally, in the most recent synthesis by Stevens et al. [40], single-case studies figured as the majority which the authors noted could impose limits on the generalizability of findings.

### *1.3. The Current Study*

In light of these gaps, this paper seeks to systematically examine the effects of oral reading fluency interventions on elementary students (i.e., first through fifth grade) identified as having reading difficulties across a range of experimental studies conducted in school settings. Specifically, we addressed the following objectives: (1) whether oral reading fluency interventions increase the oral reading fluency (i.e., accuracy, rate, and prosody) and reading comprehension of elementary students identified as having reading difficulties, and (2) the characteristics of effective interventions that facilitate these reading outcomes.

In addition to providing a more updated examination of the effectiveness of fluency interventions, the current review builds on previous syntheses [37–40] in several ways. First, we expanded our examination of types of fluency interventions to include that other than repeated reading. Second, we examined the magnitude of intervention effects on both fluency and comprehension outcomes within the same synthesis to examine the local and transfer effects of interventions, respectively, and compared the magnitude of effects of interventions on both types of outcomes. Third, our present study only reviewed group-design studies, following Stevens et al.'s point about limitations on generalization of findings with single-case designs [40]. Furthermore, we only included studies that had a control group in order to control for quality of study design and to allow for more definite conclusions to be made about the effectiveness of fluency interventions. Finally, although previous syntheses did not examine whether group size influenced the effectiveness of interventions, we consider this variable in

our present study. This is because intervention studies pertaining to different reading constructs have yielded different findings regarding optimal group size for interventions [41,42]. Thus, it is necessary to examine whether this variable influences intervention outcomes.

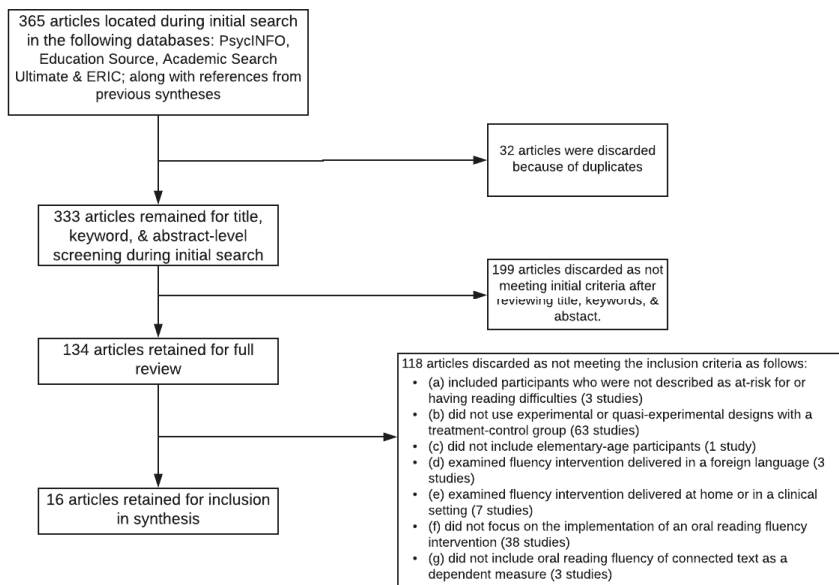
## **2. Methods**

### *2.1. Selection Procedures*

Several databases [i.e., PsycINFO, Education Source, Academic Search Ultimate and Education Resources Information Center (ERIC)] were searched using the terms oral reading fluency, and intervention\*, repeated reading, choral reading, partner reading, assisted reading, readers' theater, and reading difficulty\*, struggling reader\*, or reading disability\* and elementary, primary, or K-5. Since the National Reading Panel (NRP) report identified fluency as an essential component of reading instruction which led to increased interest in fluency research [5,43,44], only peer-reviewed papers published after the NRP report (i.e., 2000–2019) that discussed fluency interventions' impact on elementary students with reading difficulties or learning disabilities were identified to be reviewed. Selecting papers that have undergone the peer-review process, which carefully inspects studies for publication, helps to ensure the findings align with the most recent evidence-based practices in fluency instruction. In addition, the references cited in recent meta-analysis and synthesis papers examining oral reading fluency interventions were inspected for applicable papers to review [37,45]. Finally, each article's cited references were searched for relevant papers.

The initial search resulted in 365 studies (see Figure 1). Thirty-two articles were duplicates and therefore immediately removed. The titles, keywords, and abstracts of the remaining 333 studies were reviewed for exclusion criteria. Studies were excluded if the title, keywords, or abstracts clearly identified that the study (1) was a synthesis, meta-analysis, or review paper, (2) included students not enrolled in kindergarten through fifth grade, (3) contained instruction in languages other than English, (4) included students with cognitive, visual, or hearing deficits, or (5) did not target oral reading fluency intervention. Using this exclusion criteria, 199 studies were excluded based on title, keyword, or abstracts, leaving 134 studies for further review. The following inclusion criteria were used for an in-depth analysis of the 134 studies.

1. Articles had participants who were described as at-risk for or having reading difficulties. Articles with learning difficulties, struggling readers, at-risk readers, below level readers, and learning-disabled readers were all included. Articles were included if they provided segregated data for students with reading difficulties if students with reading difficulties were part of a larger group of participants. Articles with average or above-average readers were excluded.
2. Studies used experimental or quasi-experimental designs with a treatment and control group. Studies using single-case designs were excluded. Studies which did not include a no-treatment control group were excluded. Meta-analysis, commentaries, or other synthesis papers were excluded.
3. Participants were elementary-age students (i.e., kindergarten through fifth grade). Articles were included if they provided segregated data for elementary students if students were part of a larger group of participants. Articles with less than 50% of participants enrolled in elementary school were excluded.
4. Fluency intervention was delivered in English in a school setting. Studies with the intervention being delivered at home or in a clinic setting were excluded. Studies in languages other than English were excluded.
5. Articles focused on the implementation of an oral reading fluency intervention that aimed to improve students' oral reading fluency. Articles were included if at least 50% of a multi-component intervention was targeting oral reading fluency. Studies not including oral reading fluency of connected text as a dependent measure were excluded.



**Figure 1.** The Preferred Reporting items for Systematic Reviews and Meta-Analyses Flowchart.

After review, 16 of the 134 studies comprehensively reviewed met the criteria for inclusion; 118 studies were excluded because they (a) included participants who were not described as at risk for or having reading difficulties (3 studies), (b) did not use experimental or quasi-experimental designs with a treatment-control group (63 studies), (c) did not include elementary-age participants (1 study), (d) examined fluency intervention delivered in a foreign language (3 studies), (e) examined fluency intervention delivered at home or in a clinical setting (7 studies), (f) did not focus on the implementation of an oral reading fluency intervention (38 studies), or (g) did not include oral reading fluency of connected text as a dependent measure (3 studies).

## 2.2. Coding Procedures

The final 16 studies underwent an inclusive coding protocol by the first author. Twenty percent of the studies were double coded by the first and third authors; 94% interrater agreement was achieved, and discrepancies in coding were resolved via discussion. The following categories were included in all coding procedures: (a) author and study design; (b) participant information, including if English Language Learners were included in the participants; (c) treatment description, including group size, duration, and other intervention variables such as text level used and number of reads; (e) ORF dependent measures; (f) reading comprehension dependent measures if applicable; and (f) findings. See Table 1 for study information.

Table 1. Study Information.

Article Info	Study Design	Participant Information	Intervention	Multiple Features of Intervention	Intervention Description	Group Size	Intervention Duration	Outcomes Effect Sizes Calculated Using Carlson and Schmidt, 1999
[46]	E	100 second-grade students (50 Treatment, 50 Control) 11% White, 57% African American, 24% Hispanic, 4% Asian, 4% other 52 Males	Repeated Reading with Multiple Features	Chr MFR EC	Independent level text (95% accuracy or above). 3 reads: (1) choral reading of text (peers read aloud together at same pace); (2) alternate reading of text sentence by sentence; (3) weaker student reads text with stronger student helping with unknown words; (4) 1-minute timed reading and chart progress.	1:1 with Peer Coach	36 weeks 10–12 min. 3 times/week	ORF: DORF: RRMF > CG (es = 1.06)
[47]	QE	59 second-grade students (29 treatment, 30 control) 52.5% White, 28.8 % African American, 15.3% Latino 27 Males	Repeated Reading with Multiple Features	MFR PD PF VC GS	Delivered by a teacher. 3–4 reads. Begins with verbal cue (a reminder such as “Read this story the best you can and as quickly as you can.”). Teacher times student reading and student provides retell. If goal is met, new passage is given. If goal is not met, student continues to work with the same passage. After final read, graph WCPM progress and praise student.	1:1	20 weeks 10 min. 2–3 times/week	ORF: DORF: RRMF > CG (es = 1.18) GORT-F: RRMF > CG (es = 0.56) RC: GORT-C: RRMF > CG (es = 0.70)

Table 1. *Cont.*

Article Info	Study Design	Participant Information	Intervention	Multiple Features of Intervention	Intervention Description	Group Size	Intervention Duration	Outcomes Effect Sizes Calculated Using Carlson and Schmidt, 1999
[48]	E	21 second-grade students (13 Treatment, 8 Control) 95.2% Latino 16 Males	Repeated Reading with Multiple Features	MFR PD PF VC GS	Delivered by a teacher. 3–4 reads. Begins with verbal cue (a reminder such as “Read this story the best you can and as quickly as you can.”). Teacher times student reading and student provides retell. If goal is met, new passage is given. If goal is not met, student continues to work with the same passage. After final read, graph WCPM progress and praise.	1:1	20 weeks 10 min. 2–3 times/week	ORF: GORT-F: RRMF > CG (es = 0.95) RC: GORT-C: RRMF > CG (es = 1.12)
[49]	QE	20 upper elementary students (10 Treatment, 10 Control)	Listening While Reading	Audiobooks	Choice of text at or below reading level. Each intervention student had an MP3 player with an audiobook downloaded on the device as well as a hard copy of the book that corresponded to the audiobook. New audiobooks and physical books were provided to the student as needed. Control group students participated in independent silent reading.	1:1	8 weeks 20–30 min. 4–5 times/week	ORF: DORF: LWR > CG (es = 0.64)

Table 1. Cont.

Article Info	Study Design	Participant Information	Intervention	Multiple Features of Intervention	Intervention Description	Group Size	Intervention Duration	Outcomes Effect Sizes Calculated Using Carlson and Schmidt, 1999
[50]	E	46 third-grade students (23 Treatment, 23 Control) 12 Males	Listening While Reading	Audiobooks	Each intervention student had a tablet loaded with 60 children's audiobooks. The students listened and read along to one audiobook each day. Students in the no intervention control group read a book but were not provided with the audiobook to accompany the text.	1:1	4 weeks 10 min. Daily	ORF: Experimental: LWR > CG (es = 0.07)
[51]	E	24 second-grade students (6 RRMF, 6 Continuous Reading, 6 Listening only, 6 Control) 79% African American, 17% White, 4% Hispanic 10 Males	(1) Repeated Reading with Multiple Features (2) Continuous Reading (3) Listening Only	(1) ER, Chr, Positive Feedback, Oral Rendition of Practiced Texts (2) ER, Chr	Repeated Reading: Read one story 3 to 4 times over the course of the three sessions. Day 1: Echo and Choral Reading (students mimic teacher's reading or teacher read aloud same text together, respectively) Day 2: Partner Reading (students read alternate pages); Day 3: Choral Reading and Oral Performance for Small Group. Continuous Reading: A single reading of a different story at each session. Echo and Choral Reading of text (students mimic teacher's reading or teacher read aloud same text together, respectively). Listening Only: Adult reads story aloud with expression.	Small Group	6 weeks 15–20 min 3 times/week	ORE: QRI: RRMF > CG (es = 0.14) RRMF > LO (es = 0.17) CR > CG (es = 0.26) CR > LO (es = 0.58) RRMF = CR NAEP ORF Scale: RRMF > CG (es = 0.86) RRMF > LO (es = 0.91) CR > CG (es 1.28) CR > LO (es = 1.54) RRMF = CR RC: QRI: RRMF = CG RRMF = LO CR > LO (es = 0.73) CR > CG (es = 2.59)



Table 1. *Cont.*

Article Info	Study Design	Participant Information	Intervention	Multiple Features of Intervention	Intervention Description	Group Size	Intervention Duration	Outcomes Effect Sizes Calculated Using Carlson and Schmidt, 1999
[52]	E	34 second-grade students (17 Treatment, 17 Control) 57% African American, 24% Hispanic, 11% White, 4% Asian, 4% other 18 Males	Repeated Reading with Multiple Features	Chr MFR EC	Independent level text (95% accuracy or above). 3 reads: (1) choral reading of text (peers read aloud together at same pace); (2) alternate reading of text sentence by sentence; (3) weaker student reads text with stronger student helping with unknown words.	1:1 with Peer Coach	36 weeks 10–12 min, 3 times/week	ORF: DORF: RRMF > CG (es = 1.12)
[53]	E	30 students 10 2nd grade, 20 3rd grade 97% African American, 3% Hispanic 10 Males	Repeated Reading with Multiple Features	PD LPP	After school program. Instructional level text (90%–94% accuracy). The adult and student alternated reading the story 2 times each. If 100 WCPM was reached on a previously read text after a two-day retention period, a more difficult text was used.	1:1	7 weeks (2nd grade), 8 weeks (3rd grade) 30 min. 3 times/week	ORF: CBM-R probes: Immediate: RRMF > CG; Retention: RRMF > CG 2nd Grade: CBM grade 2: es = 0.14 CBM grade 3 es = -0.06 CBM grade 4 es = -0.24 3rd Grade: CBM grade 2: es = 0.13 CBM grade 3 es = -0.06 CBM grade 4 es = 0.05

Table 1. *Cont.*

Article Info	Study Design	Participant Information	Intervention	Multiple Features of Intervention	Intervention Description	Group Size	Intervention Duration	Outcomes Effect Sizes Calculated Using Carlson and Schmidt, 1999
[54]	E	37 students 16 2nd grade, 21 4th grade (21 Treatment, 16 Control) 50% White, 29% Hispanic, 18% African American, 3% Other	(1) Repeated Reading with Multiple Features (2) Continuous Reading	(1) EC (2) EC	Instructional level text used for both conditions (90%–94% accuracy). Repeated Reading+EC: Read each page of a text 3 times; teacher provided error correction as needed. Continuous Reading: Read from same book without repeating pages, teacher provided error correction as needed.	1:1	14 weeks 15 min. 3 times/week	ORF: GORT4: RRMF > CG (es = 0.53); CR > CG (es = 0.58); RRMF = CR RC: WRMT-FC: RRMF > CG (es = 1.09); CR > CG (es = 0.71); GORT-C: RRMF > CG (es = 0.75); CR > CG (es = 0.95) RRMF = CR
[55]	QE	119 students 3rd-6th Grade (59 Treatment, 60 Control)	Repeated Reading with Multiple Features	MFR EC Summarizing Predicting	3 steps to each session: Partner Reading: Stronger reader read for 5 min and then weaker reader read for 5 min with stronger reader providing error correction as needed. Weaker reader retold story after reading. Summarizing: Stronger reader read for 5 min and then weaker reader read for 5 min with stronger reader providing error correction as needed. Student reading stopped after each paragraph to summarize what was read. Predicting: Stronger reader read for 5 min and then weaker reader read for 5 min with stronger reader providing error correction as needed. Student made prediction before reading, read to check prediction, and provided summary.	1:1 with Peer Coach	15 weeks 35 min. 3 times/week	ORF: CRAB: ELL+LD es = 0.33; ELL+LA es = 0.01 RC: CRAB: ELL+LD es = 1.15; ELL+LA es = 0.83

Table 1. *Cont.*

Article Info	Study Design	Participant Information	Intervention	Multiple Features of Intervention	Intervention Description	Group Size	Intervention Duration	Outcomes Effect Sizes Calculated Using Carlson and Schmidt, 1999
[56]	QE	30 students 13.4th grade, 10 5th grade, 6 7th grade, and 1 8th grade (16 Treatment, 14 Control) 16 Males	Repeated Reading with Multiple Features	VC EC QA	Instructional level text adjusted based on prior performance (90%–94% accuracy). Instructional steps: (1) Verbal Cue (a reminder such as “Read this story the best you can and as quickly as you can.”); (2) Question Generation; (3) Read and Reread story until goal WCPM reached (2–4 reads); (4) Error Correction; (5) Question Answering.	1:1	16 weeks 10–15 min.	ORF: DORF: RRMF > CG (es = 0.38)
[57]	E	119 students 65 4th and 54 5th (54 Treatment, 65 Control) 40% African American, 24% White, 14% Other, 13% Hispanic, 9% Asian 55 Males	Repeated Reading with Multiple Features	MFR Chr Vocabulary Instruction	Delivered by trained paraprofessional. Nonfiction passages with 98% of the words used in the texts being high-frequency words or words that reflect grade-level phonics and syllable patterns Instructional Steps: (1) Vocabulary instruction (introduce new vocabulary prior to reading); (2) Students take turns reading passage; (3) Choral reading of text two times (students and teacher read aloud together at the same pace); (4) 1 min timed reading; (5) Question Answering; (6) Vocabulary instruction (review vocabulary from reading); (7) Repeat steps with a 2nd passage.	Small Group	20 weeks 30 min 4 days/week	ORF: DORF: RRMF = CG RC: WRMT-R/NU: RRMF > CG (es = 0.35)

Table 1. Contd.

Article Info	Study Design	Participant Information	Intervention	Multiple Features of Intervention	Intervention Description	Group Size	Intervention Duration	Effect Sizes Calculated Using Carlson and Schmidt, 1999	Outcomes
[58]	E	162 students 110 2nd grade, 52 3rd grade (82 Treatment, 80 Control) 30% White, 28% African American, 23% Hispanic, 16% Asian, 3% Other 96 Males	Repeated Reading with Multiple Features	MFR Chr Phonics/Word-Level Instruction EC	<p>Delivered by paraprofessional. Nonfiction passages with 98% of the words used in the texts being high-frequency words or words that reflect grade-level phonics and syllable patterns</p> <p>Instructional Steps: (1) Phonics instruction (letter-sound correspondence practice); (2) Students take turns reading passage (3) Choral reading of text two times (students and teacher read aloud together at the same pace). (4) 1-minute timed reading (5) Question Answering (6) Repeat steps with a 2nd passage.</p>	Small Group	15 weeks 30 min. 4 days/week	<p>DORF-Uniform: RRMF &gt; CG (es = 0.33) DORF-Alternate: RRMF &gt; CG (es = 0.46) GORT-4: RRMF &gt; CG (es = 0.41) RC: GORT-4 Comprehension: RRMF = CG</p>	<p>ORF: DORF-Uniform: RRMF &gt; CG (es = 0.46) DORF-Alternate: RRMF = CG GORT-4: RRMF &gt; CG (es = 0.53) RC: WRMT-R/NU: RRMF &gt; CG (es = 0.36) GORT-4 Comprehension: RRMF &gt; CG (es = 0.10) Paraprofessional: ORF: DORF-Uniform: RRMF &gt; CG (es = 0.31) DORF-Alternate: RRMF = CG GORT-4: RRMF &gt; CG (es = 0.32) RC: WRMT-R/NU: RRMF &gt; CG (es = 0.14) GORT-4 Comprehension: RRMF &gt; CG (es = -0.12)</p>
[59]	E	202 students 132 2nd grade, 70 3rd grade (98 Treatment, 104 Control) 33% White, 28% Hispanic, 21% African American, 11% Asian, 7% Other 119 Males	Repeated Reading with Multiple Features	MFR Chr Phonics/Word-Level Instruction EC	<p>Delivered by classroom teacher or paraprofessional. Nonfiction passages with 98% of the words used in the texts being high-frequency words or words that reflect grade-level phonics and syllable patterns</p> <p>Instructional Steps: (1) Phonics instruction (letter-sound correspondence practice); (2) Students take turns reading passage; (3) Choral reading of text two times (students and teacher read aloud together at the same pace); (4) 1 min timed reading; (5) Question Answering; (6) Repeat steps with a 2nd passage.</p>	Small Group	15 weeks 30 min. 4 days/week	<p>Teacher: ORF: DORF-Uniform: RRMF &gt; CG (es = 0.46) DORF-Alternate: RRMF = CG GORT-4: RRMF &gt; CG (es = 0.53) RC: WRMT-R/NU: RRMF &gt; CG (es = 0.36) GORT-4 Comprehension: RRMF &gt; CG (es = 0.10) Paraprofessional: ORF: DORF-Uniform: RRMF &gt; CG (es = 0.31) DORF-Alternate: RRMF = CG GORT-4: RRMF &gt; CG (es = 0.32) RC: WRMT-R/NU: RRMF &gt; CG (es = 0.14) GORT-4 Comprehension: RRMF &gt; CG (es = -0.12)</p>	

Table 1. *Cont.*

Article Info	Study Design	Participant Information	Intervention	Multiple Features of Intervention	Intervention Description	Group Size	Intervention Duration	Effect Sizes Calculated Using Carlson and Schmidt, 1999	Outcomes
[60]	QE	52 students 19 3rd, 21 4th, 12 5th (29 Treatment, 23 Control) 88% Hispanic, 12% White 27 Males	Repeated Reading with Multiple Features	RR+NIM	Interventional level text (one year above student's reading level). Instructional Steps: (1) Teacher and student read a page or paragraph aloud with the teacher reading slightly ahead of the student; (2) Student rereads the page or paragraph aloud independently; (3) Repeat steps until time is complete	1:1	4 weeks 20 min. Daily	DORF: RRMF > CG (es = 0.68) MFS: RRMF > CG (es = 0.98)	ORF: DORF: RRMF > CG (es = 0.68) MFS: RRMF > CG (es = 0.98)
[61]	E	57 students 1st-3rd Grade (20 students in NIM, 19 in RRMF; 18 in Control)	(1) NIM only (2) Repeated Reading with Multiple Features	2) RR+NIM	Interventional level text (one year above student's reading level). NIM Instructional Steps: (1) Teacher and student read aloud with the teacher reading slightly ahead of the student. RR+NIM Instructional Steps: (1) Teacher and student read a page or paragraph aloud with the teacher reading slightly ahead of the student; (2) Student rereads the page or paragraph aloud independently; (3) Repeat steps until time is complete.	1:1	7 weeks 20 min. 3 days/week	Badar Reading and Language Inventory: RRMF > CG (es = 0.06); NIM > CG (es = 0.12) MFS: RRMF > CG (es = 1.16); NIM > CG (es = 0.72); RRMF = NIM RC: Badar Reading and Language Inventory: Retell: RRMF > CG (es = 1.47); NIM = CG; RRMF = CG Comprehension Questions: RRMF > CG (es = 0.77); NIM > CG (es = 0.93); RRMF = NIM	ORF: Badar Reading and Language Inventory: RRMF > CG (es = 0.06); NIM > CG (es = 0.12) MFS: RRMF > CG (es = 1.16); NIM > CG (es = 0.72); RRMF = NIM RC: Badar Reading and Language Inventory: Retell: RRMF > CG (es = 1.47); NIM = CG; RRMF = CG Comprehension Questions: RRMF > CG (es = 0.77); NIM > CG (es = 0.93); RRMF = NIM

Note. E = Experimental; QE = Quasi-Experimental; RRMF = Repeated Reading with Multiple Features; NIM = Neurological Impress Method; CR = Continuous Reading; LWR = Listening While Reading; LO = Listening Only; CG = Control Group; CHR = Choral Reading; MFR = Model of Fluent Reading; EC = Error Correction; PD = Phrase Drill; PF = Performance Feedback; VC = Verbal Cues; GS = Goal Setting; ER = Echo Reading; LPP = Listening Passage Preview; QA = Question Answering; RR = Repeated Reading; ORF = Oral Reading Fluency; RC = Reading Comprehension; DORF = DIBELS Oral Reading Fluency; GORT-F = Gray Oral Reading Test-Fluency; GORT-C = Gray Oral Reading Test-Comprehension; QRI = Qualitative Reading Inventory; WKMT-PC = Woodcock Reading Mastery Test-Passage Comprehension; CRAB = Comprehensive Reading Assessment Battery; MFS = Multidimensional Fluency Scale. For a description of multiple features, see Section 3.2.1 Repeated Reading.

### 2.3. Calculation of Effect Sizes

All 16 studies included in this review provided adequate statistical information (i.e., sample means, pre- and post-intervention group means and standard deviations) that allowed us to calculate the effect sizes for the differences between the intervention and control groups on oral reading fluency outcomes. Nine of the studies provided statistical information to calculate effect sizes associated with reading comprehension outcomes. We chose to use the effect size formula by Carlson and Schmidt [62], where the difference between the intervention and control group pre–post-change mean score was divided by the pooled standard deviation of the intervention and control groups at pre-test. To reduce bias in the estimation of effect sizes, we also applied a bias correction parameter (that took into account the sample size the two groups) to the formula, as recommended in Morris [63]. This formula was chosen because (1) it accounted for pre-test differences between the intervention and control groups, (2) used a pooled standard deviation of both groups at pre-test only that reduced the potential of violating the homogeneity of variance assumption, and (3) findings from simulation studies showing the robustness of this method of effect size estimation [63]. Based on recommendations by Cohen [64], estimates of 0.20–0.49 were considered small effects, 0.50–0.79 medium effects, and values above 0.80, large effects.

## 3. Results

### 3.1. Participant Characteristics

In the 16 studies reviewed, a total of 1112 students were included—506 second grade, 207 third grade, 120 fourth grade, and 76 fifth grade. Additionally, 57 participants were identified as primary grade students and 139 were identified as upper elementary students but further grade classification was undeterminable, and seven students were enrolled in sixth through eighth grade. The studies included 460 males, 419 females, and 233 students whose gender was unidentified. Ethnicity was reported for 75.5% of the students. Of those reported, 304 were African American, 221 were Caucasian, 208 were Hispanic, 63 were Asian, and 44 were mixed races or other. Across studies, the number of English Language Learners (ELLs) were reported in seven papers [48,50,54,55,57–59], with 295 students identified as ELLs. The number of students serviced through special education was also reported in seven studies [49,54–59]. A total of 140 students were identified as receiving special education services.

### 3.2. Effective Oral Reading Fluency Interventions

The 16 studies included in this review showed that repeated reading with multiple features (e.g., choral reading, verbal cueing, error correction) was most often empirically examined in order to determine the effectiveness on improving the oral reading fluency for elementary students with reading difficulties. Assisted reading, continuous reading, and the neurological impress method were also examined to a lesser extent and often in comparison to a repeated reading condition and control group. Across the 16 studies, one study reported no statistically significant gains for oral reading fluency and effect sizes for rate and accuracy measures in the remaining 15 studies varied widely, with negligible to large effects found ( $ES = 0.01$  to  $1.18$ ). Three studies measured prosody outcomes and all found large, significant effects [51,60,61]. Effect sizes for reading comprehension also varied across papers. Of the nine studies from which effect sizes for reading comprehension outcomes could be calculated, one study reported no statistically significant gains [58], and eight studies had negligible to large effects on reading comprehension ( $ES = 0.07$ – $2.59$ ) [47,48,51,54,55,57,59,61].

#### 3.2.1. Repeated Reading

Fourteen (87.5%) of the 16 studies reviewed included a repeated reading intervention [46–48,51–61]; however, none of the studies examined a stand-alone repeated reading procedure. All of the interventions described included supplementary components in addition to the repeated reading procedures. The multiple features seen across studies included (1) a peer coach who was a classmate

identified as more capable and fluent reader, (2) teacher modeling in which the adult served as a model of fluent and prosodic reading, (3) phrase-drill error correction which had the student say the phrase from the text containing each error three times after correct pronunciation was modeled by the instructor after an initial reading, (4) error correction that provided students during or after reading with a missed word and had them repeat the word after the instructor, (5) performance feedback in which the teacher provided information on students' prosody after reading, (6) verbal cueing which provided students with a reminder such as "Read this story the best you can and as quickly as you can.", (7) goal setting which had students set a WCPM goal prior to reading, (8) echo reading which asked the student to mimic the fluent and expressive reading of the instructor, (9) choral reading in which both the teacher and students read the text aloud together in unison, (10) performance of text, (11) listening passage preview which allowed students to listen and follow along while an adult read the text aloud with expression, (12) question answering after reading to promote comprehension, (13) neurological impress method in which the teacher read aloud slightly ahead of the student, and (14) phonics or vocabulary instruction. The number of multiple features included in repeated reading interventions varied widely across studies (See Table 1).

*One-on-one with the teacher.* In seven of the studies [47,48,53,54,56,60,61], students participated in one-on-one sessions of a repeated reading with multiple features intervention with an adult (e.g., teacher, paraprofessional, trained research assistant). With regard to oral reading fluency, two studies were found to have negligible effects on students' rate and accuracy by the authors [53,61]. The remaining five studies were found to have small to large effect sizes (i.e., 0.38 to 1.18) on standardized measures of oral reading fluency (i.e., Dynamic Indicators of Basic Early Literacy Skills Oral Reading Fluency, Gray Oral Reading Test-Fluency) [47,48,54,56,60]. Four studies included measures of reading comprehension and found moderate to large effect sizes (i.e., 0.70–1.47) [47,48,54,61].

Specifically, Begeny, Mitchell, Whitehouse, Harris, and Stage as well as Begeny, Ross, Greene, Mitchell, and Whitehouse provided one-on-one repeated reading intervention three times a week to second graders who were native speakers of English and English Language Learners, respectively [47,48]. In both studies, the intervention produced large effect sizes (1.18 and 0.95) on students' oral reading fluency, as well as moderate and large effects on reading comprehension (ES = 0.70 and 1.12), respectively.

Young, Mohr, and Rasinski, examined the effects of a hybrid intervention combining repeated reading and the Neurological Impress Method (NIM) with third through fifth graders [60]. Students in the hybrid intervention condition demonstrated a moderately significant increase in rate and accuracy (ES = 0.68). In contrast, Young, Pearce, Gomez, Christensen, Pletcher, and Fleming tested the same hybrid intervention on a group of first- through third-grade students [61]. While negligible effects on oral reading fluency were found in this sample (ES = 0.07), moderate to large effects were found for reading comprehension (ES = 0.77 for comprehension questions, ES = 1.47 for passage retell). In addition to the intervention group and the no intervention control group, Young et al. also included a NIM-only group [61]. The students in the NIM only group were not provided with the opportunity to reread the text. Similar to the hybrid intervention condition, no effects on students' rate and accuracy were found by the authors. Further, the authors reported that the NIM-only condition had a nonsignificant effect on the passage retell aspect of reading comprehension but improved students' ability to answer comprehension questions after reading, as evidenced by a large, statistically significant effect size (ES = 0.93).

O'Connor, White, and Swanson provided second- and fourth-grade students with a repeated reading intervention that included error correction from the teacher [54]. The intervention, which lasted 14 weeks, produced a moderate effect (ES = 0.53) on students' oral reading fluency and a moderate to large effect on reading comprehension (ES = 1.09 on Woodcock Reading Mastery Test-Passage Comprehension and ES = 0.75 on Gray Oral Reading Test-Comprehension).

Therrien, Wickstrom, and Jones used a repeated reading intervention with fourth- through eighth-grade students which included a series of instructional steps such as verbal cueing and error

correction [56]. The intervention was found to produce a small effect size ( $ES = 0.38$ ) on students' oral reading fluency.

Finally, Martens et al. examined an after-school fluency training program in which second and third graders received a repeated reading intervention provided by graduate and undergraduate students [53]. Based on grade level CBM probes, negligible effects on students' oral reading fluency were found ( $ES = 0.14$  for 2nd graders on 2nd grade probe and  $0.06$  for 3rd graders on 3rd grade probe). While the authors investigated rate and accuracy two days after the intervention ended, this was only completed for the intervention group and consequently, not enough information was provided to be able to calculate effect sizes associated with between-group differences.

*One-on-one with a peer coach.* Three studies examined the use of a repeated reading intervention in which students worked one-on-one with a peer coach [46,52,55]. Two of the three studies produced large effects on oral reading fluency outcomes [50,54].

In both Algozzine, Marr, Kavel, and Dugan and Marr, Algozzine, Nicholson, and Dugan [46,52], students worked together for 10–12 min, three times a week for 36 weeks. While both Algozzine et al. and Marr et al. found students in the intervention group had statistically significant gains in oral reading fluency from pre-test to post-test, statistically significant gains were also found for students in the no-intervention control group although at a lower rate. However, in both Algozzine et al. and Marr et al., repeated reading with a peer coach was found to produce large effect sizes on students' oral reading fluency (effect size =  $1.06$  and  $1.12$ , respectively). While reading comprehension growth in both studies was measured through an assessment created and used by the participating school district, data was only reported for the intervention group. Therefore, no effect sizes associated with between-group differences could be calculated for reading comprehension in these studies.

Similarly, Saenz, Fuchs, and Fuchs investigated Peer-Assisted Learning Strategies (PALS), with 20 special education and 33 low-achieving third- through sixth-grade students from bilingual classrooms [55]. Low-achieving students in this study were those in the lowest quartile of the class rank based on classroom observations, previous scores on state competence exams, and district informal reading inventories. In the PALS intervention, students worked in pairs in order to complete three readings of a text. With regard to oral reading fluency, a small effect ( $ES = 0.33$ ) was found for ELL students with learning disabilities who participated in the PALS program three times a week for 15 weeks. Conversely, the same intervention demonstrated a negligible effect ( $0.01$ ) for ELL students who were identified as low achieving. Further, in terms of reading comprehension, both ELL students with learning disabilities as well as ELL students who were identified as low achieving had large, statistically significant gains ( $ES = 1.15$  for ELL+LD and  $0.83$  for ELL+ low achieving).

*Small group with a teacher.* Four studies had students working with a teacher in small groups of peers with similar needs and negligible to small effects were found with regard to oral reading fluency and reading comprehension outcomes [51,57–59]. Kuhn examined the effects on oral reading fluency and reading comprehension of (1) a repeated reading intervention with multiple features, (2) a listening-only intervention, (3) a continuous reading intervention, and (4) a no-intervention control group [51]. After six weeks of intervention, Kuhn concluded that students in the repeated reading condition outperformed students in the listening-only condition as well as the control group, although calculated effect sizes were trivial ( $ES = 0.17$  and  $0.14$ , respectively). Additionally, non-significant gains in reading comprehension were found in the repeated reading condition, the listening-only condition, and the control group.

Vadasy and Sanders examined the same repeated reading intervention, QuickReads, with second- and third-grade students, including English Language Learners and special education students, across multiple sites [58,59]. The only difference between the studies was that Vadasy and Sanders first examined the effects of the intervention delivered by a trained paraprofessional and later examined the effects of the intervention delivered by a classroom teacher [58,59].

In both studies [58,59], the intervention procedures first had the instructor complete a brief letter–sound practice with the students due to the large number of students in the study with low



word reading skills. Next, throughout the repeated reading procedure, instructors provided students with error correction strategies for students' miscues as needed (e.g., encouraging the student to sound out the word, phoneme by phoneme, and then blend the sounds; helping the student to segment a multisyllable word and then put the parts together). Both studies found the repeated reading intervention, QuickReads, to produce a small effect size on students' oral reading fluency when delivered by a trained paraprofessional (ES = 0.41 and 0.32, respectively) and a moderate effect when delivered by a classroom teacher (ES = 0.53) [58,59]. While Vadasy and Sanders found that the intervention employed by a paraprofessional did not produce a statistically significant difference in reading comprehension over the control group [58], the researchers determined that QuickReads delivered by a classroom teacher produced a small effect (ES = 0.36) [59].

Lastly, Vadasy and Sanders also examined a repeated reading intervention which included 199 fourth- and fifth-grade students with reading difficulties [57]. However, differing from their other studies [58,59], this intervention began and ended sessions with vocabulary instruction rather than letter-sound practice and, consequently, no error correction strategies were provided to students as they read. At the conclusion of the study, the researchers found that there were no significant treatment effects for oral reading fluency. Further, the average oral reading fluency rate of students in the intervention group remained in the lowest quartile, based on Hasbrouck and Tindal's norms for fourth and fifth grade [65]. However, a small effect (0.35) was found for reading comprehension [57].

### 3.2.2. Listening While Reading

Two studies examined the effects of an intervention which had students individually listen along to an audiobook while reading [49,50]. Esteves and Whitten's study investigated the assisted reading intervention with 20 upper elementary students, all of whom were serviced through special education with individualized education plan goals in the area of reading [49]. The researchers found that the students in the intervention group demonstrated a larger increase in the number of words read correctly from pre-test to post-test as compared to students in the no-intervention control group. A moderate effect on students' rate and accuracy was found (ES = 0.64).

Friedland, Gilman, Johnson, and Demeke also investigated the effect of listening while reading using audiobooks on a group of 46 third-grade students—almost half of which were English language learners [50]. After four weeks of intervention, Friedland and colleagues concluded that students in the treatment group demonstrated a greater improvement in the number of words read correctly per minute than students in the control group. However, a negligible effect size of 0.07 was obtained from our calculations. Interestingly, neither study of listening while reading included a measure of students' reading comprehension. Thus, we were not able to examine whether this method of fluency intervention also increased students' reading comprehension.

### 3.2.3. Continuous Reading

A continuous reading intervention was examined in a one-on-one setting by O'Connor et al. and a small group setting by Kuhn [51,54]. Rather than rereading the same text multiple times, students in the continuous reading condition read continuously for the entirety of the intervention session and completed a single reading of a different text during each intervention session. Both studies found that continuous reading produced moderate gains in students' oral reading fluency rate and accuracy as well as moderate-to-large gains in reading comprehension.

In O'Connor et al.'s study [54], second- and fourth-grade students in the continuous reading condition read a text at their instructional level (88%–94% accuracy) one-on-one with the teacher. The researchers investigated this continuous reading condition against a one-on-one repeated reading intervention as well as a no-intervention control group. Students in both intervention conditions read from the same text, only differing on whether they read the same page repeatedly or read multiple pages without repeating. Based on oral reading fluency rate scores at the end of the study, the researchers found that students in the continuous reading condition significantly outperformed

students in the no intervention control group, with moderate effect sizes found ( $ES = 0.58$ ). Further, a moderate-to-large effect ( $ES = 0.71$  on the Woodcock Reading Mastery Test-Passage Comprehension and  $ES = 0.95$  on the Gray Oral Reading Test-Comprehension) was also found for reading comprehension. Comparing the repeated-reading-intervention and no intervention groups, moderate and large effect sizes for differences in oral reading fluency and reading comprehension were obtained, respectively ( $ES = 0.53$  and  $1.93$ ), favoring the repeated reading condition. It is important to note, however, that students in the repeated-reading-intervention did not differ significantly from students in the continuous-reading-intervention on measures of oral reading fluency or reading comprehension.

Similarly, Kuhn included a continuous reading condition in her study of oral reading fluency interventions with 24 second-grade students [51]. Differing from O'Connor et al.'s study [54], students in Kuhn's continuous reading intervention engaged in small-group echo or choral reading of a text with the adult tutor. At the end of the study, Kuhn reported that the students in the continuous reading intervention group outperformed students in the listening-only condition as well as the no-intervention control group for fluency, with calculated effect sizes of  $0.58$  and  $0.26$  respectively. However, mirroring O'Connor et al. [54], there was no statistically significant difference between students in the continuous reading and repeated reading conditions for oral reading fluency. Further, only students in the continuous reading condition demonstrated greater improvement in reading comprehension in comparison to the control group, and a large effect was obtained in the calculation of between-group differences ( $ES = 2.59$ ).

### 3.3. Prosody

While all of the studies reviewed provided measures of rate and accuracy, only three (18.8%) studies reported measures of students' prosody [51,60,61]. Kuhn assessed students' prosody using the NAEP's Oral Reading Fluency Scale and reported 100% interrater reliability between two raters on this measure [51,66]. Kuhn found that both intervention conditions (i.e., repeated reading and continuous reading) produced gains in students' prosody that were not seen in students who were in the listening-only condition or the no-intervention control group. Calculated effect sizes found large effects on prosody outcomes for both repeated reading and continuous reading in comparison to a control group ( $ES = 0.86$  and  $1.28$ , respectively).

Young and colleagues used the Multidimensional Fluency Scale (MFS), a prosody rubric which calculated a score in four distinct categories: (1) volume and expression, (2) phrasing, (3) smoothness, and (4) pace, in order to assess students' prosody [60,61]. Rasinski, Rikli, and Johnston previously demonstrated that the MFS was a reliable and valid measure of prosodic reading [67]. Across studies, the hybrid intervention of repeated reading and NIM produced large, significant effects on students' prosody ( $ES = 0.98$  and  $1.16$ , respectively) [55,57]. Further, the intervention consisting of NIM alone also yielded a moderate effect size ( $0.72$ ) for prosody [61].

## 4. Discussion

The primary objective of the present systematic review was to examine the effectiveness of oral reading fluency interventions on aspects of oral reading fluency (i.e., accuracy, rate, and prosody) and reading comprehension for children in first through fifth grades with reading difficulties. Additionally, we identified characteristics pertaining to the intervention format for studies where positive gains in reading outcomes were made after intervention in reading fluency was provided.

With regard to the first question on the effectiveness of oral language interventions on reading outcomes, out of the 16 studies examined in this review, 12 (75%) were found to produce small to large effects on the oral reading fluency of students with reading difficulties. Further, eight (50%) studies had small to large effects on reading comprehension outcomes for these students, with the majority of interventions yielding moderate to large effect sizes across a variety of measures. Broadly, these findings point to the efficacy of targeted fluency instruction in promoting reading comprehension, and to a lesser extent, oral reading fluency outcomes, among first to fifth graders with reading difficulties.

In considering these results, we noted four interesting trends. First, the findings demonstrated that benefits of fluency interventions were not limited only to aspects of fluency that were the target of the interventions but also extended to reading comprehension outcomes. This finding is not surprising for two reasons. The first is that it is logical when we explain them within reading models that consider the role of fluency. Chall's stages of reading development outline the importance of fluency as a bridge that moves students from focusing on decoding to extracting meaning from connected texts [3,37–39]. Similarly, when we consider the theory of automatic word processing, oral reading fluency interventions provide students with practice in reading connected texts that help students gain automaticity with word recognition and thus devote more cognitive resources to comprehension [11]. Second, many of the studies reviewed reported having students engage in summarizing, generating questions, and retelling texts that they have read, which are activities included in reading comprehension interventions that help struggling students [68,69]. Further, since many of the interventions reviewed also included re-reading of texts (a fluency building activity) as a central element, our findings also suggest the utility of including fluency-building elements in interventions aimed at improving reading comprehension. This is aligned with research suggesting that multifaceted interventions that incorporate the teaching of a variety of reading-related skills are more effective than those that target only one skill [70,71]. Future research could investigate oral reading fluency interventions in comparison to interventions directly targeting reading comprehension for both fluency and reading comprehension outcomes. This may help to provide teachers with greater insight on the most effective interventions for students with reading difficulties.

The second trend is that effect sizes yielded for reading comprehension outcomes were on average larger than that for oral reading fluency. Additionally, there was a certain degree of heterogeneity of magnitude of effect sizes across studies on both outcomes, although the heterogeneity appeared to be more salient in oral reading fluency outcomes. Considering that the studies reviewed in this present synthesis examined reading fluency interventions, outcome measures of oral reading fluency would be considered more proximal outcomes as compared to reading comprehension. Therefore, this trend is somewhat surprising since it has been shown that effects of reading interventions on proximal outcomes are often greater than distal outcomes [72,73]. We put forth two possible explanations for this trend, both attributable to the method of measurement. Current conceptualizations of reading fluency favor the view that fluency encompasses both decoding and comprehension, as opposed to just decoding. Most studies reviewed assessed oral reading fluency using the Dynamic Indicators of Basic Early Literacy Skills (DIBELS), which functions more as a screening tool that focuses primarily on accuracy and speed of decoding rather than a comprehensive measure of reading skills [74]. Because inconsistencies in the association between fluency subtests of the DIBELS have been reported in some studies [75], researchers have suggested that the use of one-minute probes in DIBELS might not adequately capture all aspects of reading fluency [76]. This could explain why reading comprehension outcomes showed greater effect sizes as compared to oral reading fluency. On a related note, it was observed that there were more instances of the use of informal measures of oral reading fluency as compared to reading comprehension in the studies reviewed and most of these measures yielded increases of negligible effects for rate and accuracy outcomes. A major concern with the use of informal reading measures relates to the reliability of these measures [77], therefore, this trend calls for future studies to examine the effects of interventions on both informal and formal measures of fluency in order to gain a better picture of the extent of impact of fluency interventions.

The third trend is that outcome measures of fluency used to assess the efficacy of the interventions focused on accuracy and rate aspects in most of the studies reviewed. This is predictable considering that these two components are widely regarded as representative components of fluency [10]. In contrast, only three studies documented interventions that examined or included prosody measures. This is despite the fact that prosody is also highlighted as a component of fluency in both the NRP and the Common Core State Standards (CCSS) as well as by prominent scholars in the field [5,78,79]. The lack of attention to prosody has been highlighted by researchers [22]. We put forth two reasons for

why this third component is relatively neglected as compared to the other two aspects. First, there have been issues surrounding the accuracy of measurement of this component. Prosody encompasses several subcomponents such as pitch, intonation, and phrasing and is typically assessed using rating scales [80]. However, researchers have pointed out that rating scales might not adequately differentiate between readers of varying levels of fluency [81]. Second, the assessment of prosody is often viewed as being subjective based on the views of the person completing the assessment, which raises questions about the validity and reliability issues in assessing prosody [82]. In the present study, all three studies reported in this study showed positive increases in prosody following intervention, although different measures and aspects of prosody were measured across studies. However, the dearth of literature on prosody and variability in measurement of prosody makes it difficult to draw definite conclusions on the effects of interventions on prosody. This gap points to the need for future research to assess this aspect more systematically and comprehensively.

The fourth trend is that close to 90% of the studies reviewed in this search examined the same type of intervention, repeated reading. This focus on repeated reading in the literature is not surprising considering the strong theoretical underpinnings of this strategy [83,84], leading to researchers and educators alike viewing it favorably as an evidence-based approach to improving fluency [43]. This trend concurs with that in the synthesis conducted by Kim, Bryant, Bryant, and Park who found that 75% of the studies reviewed focused on repeated reading interventions for students with learning disabilities [45]. Our findings lend further support to the efficacy of this type of reading intervention for children with reading difficulties in promoting reading outcomes (see [39] for a review). They also provide further justification for the continued use of repeated reading in building up fluency. Repeated reading is effective because it addresses at least two of the three main problems that lead to dysfluent reading as identified in theoretical frameworks. These three main problems pertain to (1) difficulty with identifying prosodic cues, (2) labored word recognition, and (3) difficulty making associations between meanings and main ideas in text [85]. Repeated reading of text promotes practice with reading which facilitates speed and ease in the recognition of words/texts. This in turn, leads to more working memory resources being freed up, which according to Samuels and Laberge's model of automaticity in reading, allows one to focus on higher-order processes pertaining to comprehension such as accessing meaning of words and building up a situation model of the text [15]. Furthermore, at the level of higher-order processing, successive readings of the same text allow readers to focus on different pieces of information in the text across readings and improve memory of central ideas that facilitate comprehension [86]. However, despite the success of the repeated reading method in promoting fluency and reading outcomes across studies, researchers also point out that specific characteristics of interventions impact the extent in which fluency interventions are effective [38,39,45,87,88]. Our second research objective thus focused on intervention characteristics pertaining to (1) instructional variables (e.g., pre-instructional support, the difficulty level of text used, the number of times the text is read, and the amount of feedback provided), and (2) type of interventionist (e.g., teacher, clinician, researcher, parent, or peer coach) and how they influenced intervention outcomes.

It would appear that by examining effect sizes only across studies that there was no clear pattern of how type of interventionist relates to effectiveness of fluency interventions. This is as interventions across studies that were facilitated by either an adult or a peer coach yielded similarly positive effects on oral reading fluency outcomes as interventions that were facilitated by both an adult or a peer coach during the school day tended to yield positive effects on oral reading fluency outcomes. However, a closer examination of characteristics of studies suggests the need to consider a combination of other factors when evaluating effect sizes relating to type of interventionist. The first factor is whether the interventionist received appropriate and adequate training. We note that across studies, training was always provided to both the adults and students prior to the start of the intervention. For example, in Begeny and colleague's study which yielded sizeable effect sizes, it was highlighted that the teachers participating in the repeated reading intervention were provided with two 3-hour training sessions. In these sessions, they observed a trainer modeling the intervention procedures and were provided with

time to practice implementing the intervention with one another under guidance from the research staff [47,48]. Training such as this may be key to the success of the oral reading fluency intervention since other studies show reading interventions conducted by trained tutors have been shown to be more effective than untrained tutors [89].

The second factor to consider is the close association between decoding (i.e., phonemic awareness, letter–sound correspondences) and fluency skills. It was observed that in three of the studies where a trained teacher facilitated repeated reading intervention, no effects on students' rate and accuracy outcomes were found. The authors across these studies made mention of issues pertaining to decoding skills in accounting for these null findings. For instance, Vadasy and Sanders attributed their non-significant findings to the use of a vocabulary extension activity rather than explicit instruction in alphabetic knowledge and decoding strategies in the intervention [57], where the latter was considered as being more crucial to developing automaticity in reading [11]. Similarly, Martens et al. acknowledged that the second-grade students in their sample may have yet to master the foundational reading skills (i.e., phonemic awareness, sight word vocabulary) necessary for fluency-building interventions to be effective [53]. The importance of considering decoding elements in addition to fluency building activities in fluency interventions echoes the views of researchers in the field [85,90]. Future research that directly compares interventions with and without a focus on decoding and/or considers decoding abilities of children before and after interventions would provide insights into the significance of including decoding instruction to fluency interventions.

In thinking about group size, intervention provided by an adult in a one-on-one setting appeared to be more effective than interventions utilizing a small-group format. Nine of the 16 studies reviewed provided an oral reading fluency intervention in a one-on-one setting with an adult [47,48,53,54,56,60,61]. The majority (56%) of studies that employed a one-on-one student-to-teacher ratio for interventions were found to produce moderate to large effect sizes ( $ES = 0.53$ – $1.18$  for oral reading fluency and  $ES = 0.70$ – $1.47$  for reading comprehension) whereas the remainder of studies yielded small or negligible effects for oral reading fluency rate and accuracy. The variability in effect sizes across studies should be discussed in the context of other intervention characteristics. For one, previous research has indicated that the inclusion of more fluency-building features in instruction promoted better outcomes [39]. An examination of the magnitude of effect sizes across studies with one-on-one formats appear to support this. For instance, Begeny and colleagues' two studies which yielded large effect sizes on oral reading fluency measures [47,48], incorporated a total of seven additional features—six of which targeted aspects of fluency including prosody (i.e., teacher modeling, performance feedback, verbal cueing), accuracy (i.e., phrase-drill error correction), and motivation (i.e., goal setting, reward system). Conversely, in Therrien et al. [56], where a small effect was found, only three of the five features in the intervention focused on building fluency (i.e., verbal cueing, goal setting, error correction).

Interestingly, across studies, the repeated reading intervention often included a model of fluent reading or accurate word pronunciation (e.g., error correction, phrase drill). Chard et al. highlighted that repeated reading with a model is often more effective at increasing students' oral reading fluency and reading comprehension [38]. However, our review showed that some studies with negligible or small effects on oral reading fluency also included modeling procedures. For example, Martens et al. examined an after-school intervention program which included modeling through listening passage preview and phrase drill error correction [53]. While negligible effects were found for students oral reading fluency, it is unclear if absenteeism and attrition impacted the results as these issues have plagued other after school intervention studies [91]. This suggests the need for future research to examine the context in which these modeling strategies are most effective.

In addition, intervention duration also appears to affect the effectiveness of different types of one-on-one interventions. To illustrate, while Esteves and Whitten found a moderate effect for a listening while reading intervention ( $ES = 0.64$ ) [49], Friedland et al.'s intervention of the same nature was found to have no effect [50]. When examining the two studies, the duration of intervention was vastly different, with students in Esteves and Whitten's study spending three to six times longer in the

intervention than students in Friedland et al.'s study. Conversely, the duration of the intervention did not appear to contribute to the effectiveness of the repeated reading interventions examined. This suggests that the success of a listening while reading intervention, but not repeated reading, might be partly dependent on duration of intervention. However, we recognize that the available sample of studies for such a comparison is small in the present review, and thus this hypothesis necessitates further validation.

In contrast to one-on-one interventions, three of the four studies with small-group format interventions yielded negligible or small effects in fluency and/or reading comprehension [57–59]. The only exception was the study by Kuhn [51] where a large effect size was found for reading comprehension outcomes. Although the findings appear to support one-on-one interventions, a practical constraint to consider is that this format is time consuming and classroom teachers may not be able to devote the time needed to provide one-on-one interventions. This is especially true if the classroom has a high percentage of students with or at risk for reading difficulties. One viable option may be the use of peer tutors, as two studies of peer coaching in this review produced large and significant effects for oral reading fluency [46,52]. However, these findings should also be interpreted with caution since three of the four studies on small groups and two of the three studies on peer coaches came from the same research teams, respectively. In addition, we note that there was substantial heterogeneity in the features of the intervention between studies that conducted small-group interventions as opposed to those that carried out interventions in one-on-one formats. Therefore, future research examining small-group oral reading fluency interventions, especially in direct comparison to one-on-one interventions, may be beneficial in informing classroom practices.

#### *Limitations and Future Research*

This review should be considered in the context of its limitations. One limitation is that conclusions about reading comprehension should be interpreted with caution since a wide variety of reading comprehension measures were used across studies. Future research is encouraged to utilize common standardized measures of reading comprehension so that results across studies may be compared in a more meaningful manner.

Furthermore, one important question posed by Chard et al. is still left unanswered [38]. Chard et al. suggested that future researchers investigate whether the effects of fluency building interventions are sustainable over time. In the present synthesis, only one study included a measure of retention which assessed students' oral reading fluency two days post-intervention. Future research may also wish to examine the long-term maintenance of oral reading fluency gains found in students who received a successful fluency intervention, a limitation acknowledged by Martens and colleagues [53]. In addition, the findings of this synthesis also point to gaps in our understanding of the efficacy of interventions other than repeated reading and on prosody outcomes. Future studies should examine other commonly used interventions such as choral and echo reading or readers' theater and examine prosody outcomes in the assessment of fluency in order to provide a more comprehensive understanding of fluency instruction and reading. Finally, researchers have acknowledged that the increasing attention to fluency in the US context can be attributed in large part to its inclusion in the National Reading Panel report published in 2000 [5]. This could explain why studies yielded for this and previous reviews were conducted primarily in the U.S. context despite no country filters being imposed in the search. The lack of diversity in this respect points to the need for more studies in other contexts where differences in instructional curriculum might exist in order to understand whether and how instructional curriculum might moderate the impact of fluency interventions. This is especially important considering that fluency is a central component in curriculum standards in many countries and languages [6].

#### **5. Implications and Conclusions**

Despite its limitations, the present synthesis contributes to the literature in three ways. First, our findings support previous syntheses—the last of which was conducted by Stevens et al. with studies

between 2001 and 2014 [40]. Generally, fluency interventions examined, which constituted mostly repeated reading procedures, made positive contributions to gains in reading fluency and reading comprehension among children with reading difficulties. Considering that failure to replicate findings presents as a salient issue in research [92,93], the replication of findings of previous syntheses despite not including single-case studies and only focusing on those studies that included a control group provides convergent evidence for the importance of fluency on reading outcomes. Second, extending from previous syntheses, our finding compared relative gains of fluency interventions on fluency and reading comprehension outcomes. The observation that fluency interventions produced greater gains in comprehension as compared to fluency in general adds credence to the current view that reading fluency relates to both decoding and comprehension rather than the earlier conceptualization that fluency was confined mainly to word recognition [5,94]. Third, the current study also examined characteristics of interventions and their impact on reading outcomes, including the impact of group size in intervention, a characteristic that had not been systematically investigated in previous studies. Our findings thus have implications on instructional practices in the classroom.

The findings from this synthesis suggest that elementary students with reading difficulties would benefit from one-on-one interventions which include a model of fluent reading who has received adequate training. The findings support earlier research which suggests that the repeated reading of text is one way to build the oral reading fluency of students with reading difficulties. However, continuous reading with teacher support may also be an effective method. Moreover, although listening while reading and small-group interventions produced only small to moderate effect sizes, they may be more efficient means of improving oral reading fluency since they require less instructional time of the classroom teacher. However, an important fact to remember about any intervention, and one Young et al. also mentioned, is that there is not one intervention that is effective for every student and if not responding to one type of fluency intervention, some students may need an alternate form of instruction [60].

Research on the efficacy of certain approaches to teaching fluency has led to changes in instructional practices and should continue to do so [95]. With more recent focus on Response to Intervention (RTI) and Multi-Tiered Systems of Support (MTSS), evidence-based fluency strategies should be used to target students with and at risk for reading difficulties in classroom instruction, as well as in small-group intervention outside of the classroom. Listening while reading, repeated reading with multiple features, and continuous reading with teacher support are methods that can be effectively used across a variety of contexts for increasing the oral reading fluency of elementary students who need more targeted instruction.

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Article

# Whole Class or Small Group Fluency Instruction: A Tutorial of Four Effective Approaches

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**Abstract:** Four scientifically validated approaches to fluency instruction (Fluency-Oriented Reading Instruction, Wide Fluency-Oriented Reading Instruction, Fluency-Oriented Oral Reading, and Wide Fluency-Oriented Oral Reading) are reviewed. Two for the whole class and two for small groups. Key components of fluency, automaticity, and prosody are defined, and their contribution to reading comprehension is discussed. Automaticity contributes through its freeing up of attention to attend to meaning, and prosody contributes through its addressing of pacing and expression that, in turn, reflect textual meaning. Four principles for effective fluency instruction are also presented: Modeling, extensive opportunities for practice, the use of scaffolding, and the incorporation of prosodic elements. The four instructional approaches presented in this article are based on two different strategies for integrating extensive opportunities to read: Repeated versus wide reading. All four approaches use challenging texts, or texts at the upper end of the learners' zone of proximal development, thus providing learners with access to a broader range of vocabulary and concepts than would be the case if they read only instructional level texts. All four also provided highly effective procedures for either whole-class or small-group reading instruction. The goal of this summary is to provide readers with effective approaches for classroom instruction.

**Keywords:** fluency; repeated reading; wide reading; challenging texts

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When thinking about reading development, word recognition and comprehension are generally at the fore (e.g., [1,2]). However, since the publication of the National Reading Panel (NRP) report [3], fluency has received an increased amount of attention as a link between the two. As research indicates (e.g., [4,5]), fluency is critical to the overall reading process, and it is important to discuss not only the components of fluency—automaticity and prosody—but also how they come together in fluent reading. This article will briefly consider fluency's role in terms of development and then present a review of four research-based instructional approaches, two for the whole class and two a for small group, that have been shown to increase students' word recognition, fluency, and comprehension. The goal of the review is to provide a concise summary of these highly effective approaches. Importantly, they are also easy-to-implement additions to the reading instruction that occurs in the classroom. Given the challenges many children face in their reading development and the importance of scaffolded reading in developing students' reading, these approaches can be an important addition to your reading curriculum.

## 1. Fluency's Role in Reading Development

According to researchers (e.g., [6,7]), fluency development is important for two reasons. First, it helps learners shift from slow and deliberate word decoding to automatic word recognition. Second, it allows readers to apply prosodic (e.g., expressive) elements to text. For most learners, this stage of development occurs after they have established basic decoding skills in the first grade. Traditionally, fluency instruction begins in the latter part of first grade and continues throughout third grade (e.g., [8]), even as learners are developing their knowledge of more complex word patterns

(e.g., long vowel sounds, diagraphs, etc.). Further, effective reading is built upon strong oral language, and the two reinforce one another (e.g., strong oral language helps students develop their phonemic awareness, which, in turn, helps learners develop alphabetic knowledge) [3].

The primary goals of fluency instruction are two-fold, to help students consolidate what they have learned about word recognition and to apply elements of oral language to text (e.g., [4,5]). In terms of the former, the shift is important because it allows readers to attend to the meaning of what is being read rather than focusing their attention on word identification [6]. Prosody also contributes to fluency through the application of elements of oral language to what is being read [9], and it provides a unique contribution to comprehension [10]. However, fluent reading does not develop simply by teaching word recognition in isolation. Instead, it needs to be combined with the extensive scaffolded reading of connected text (e.g., [4]).

Automaticity. Beginning, or novice [11], readers spend a great deal of attention, decoding each word they encounter in a text. In fact, when you listen to first graders read aloud, you will likely notice that their reading is uneven and lacking in expression. Because they expend so much of their attention on word recognition, they have little left over to determine the text's meaning. While this type of decoding is typical of beginning readers, it is important that learners consolidate what they have learned about word recognition as they shift toward reading fluency. In other words, they need to develop automaticity, so their word recognition is quick, accurate, and effortless. This shift frees up their attention, allowing them to comprehend what is being read.

Prosody. Components of prosody, such as phrasing, stress, and emphasis, all combine to make a unique contribution to comprehension beyond that of automatic word recognition [10]. As skilled readers, when we read a text, these elements work together to reflect the meaning of the text, thereby enhancing comprehension. Luckily, some of these elements can be represented by punctuation. However, several aspects of prosody cannot. For example, it is usually clear where phrasing exists in spoken language, but, while some written phrases are identified through commas, others are implied. If students are to comprehend fully, they need to learn how to apply these elements to what is being read. This can be accomplished through instruction that focuses on phrasing rather than simply on increasing learners' reading rate [12].

Principles of fluency instruction. Before discussing specific approaches to fluency instruction, it is useful to outline those instructional elements that effective approaches have in common (e.g., [13,14]). These are: Modeling, extensive opportunities for practice, the use of scaffolding, and the incorporation of prosodic elements. As learners shift from intentional decoding to fluent reading, the primary instructional focus needs to be on helping students read connected texts. This practice can occur either through guided instruction (assisted reading) or through independent practice (unassisted reading) [15]. Such practice allows students to apply their developing knowledge of both word identification and prosody in context. By focusing on connected text, students are also learning to construct meaning and to recognize when their comprehension breaks down [11].

The first principle of fluency instruction is to model what fluent reading should sound like. This allows students to develop a clear understanding of their goal (e.g., [13,14]). This can be accomplished by reading aloud as part of the classroom routine, and the genre used should range from poetry to non-fiction. Unfortunately, while such modeling is important, it will not assist learners in developing their own fluency in and of itself. Instead, the second principle notes that, for students to become fluent readers, they need to spend a substantial amount of time actually reading. One of the key components of the approaches discussed below is that they maximize the amount of time students spend reading connected text, increasing the average number of minutes from under 10 per day (e.g., [16]) to between 20 and 30 (e.g., [17]).

The third principle of effective fluency instruction is the incorporation of support or scaffolding (e.g., [13,14]). To maximize fluency instruction's effectiveness, it needs to make use of challenging texts (i.e., those at the higher end of students' zone of proximal development). Scaffolding is necessary if students are to succeed with material that would otherwise be too difficult (e.g., [4]).

Both unassisted approaches and assisted approaches make use of some form of scaffolding [9]. Unassisted approaches involve repeated readings in which students independently read a passage multiple times. This repetition serves as the reader's scaffold. In assisted approaches, students read along with the teacher or another more-skilled reader who provides them with support. Assisted approaches can be used either with repeated readings (i.e., a single text that is read multiple times) or with wide reading (i.e., multiple texts that are read one time each for a similar amount of time). Without this support, students are unlikely to be successful when reading challenging material.

The final principle involves integrating prosodic elements into fluency instruction. It is important to address prosody explicitly so that students learn to focus on appropriate pacing, along with other elements that contribute to expression, rather than simply on speed [9,12]. When considering a particular fluency procedure, it is helpful to check the strategy against these principles to ensure its effectiveness and to maximize the instructional time available. The next section will discuss four research-based instructional approaches (two whole class and two small group interventions) that do just that. The whole class approaches are meant for second and third-grade classrooms. It is useful to think about these approaches in terms of the Common Core State Standards or the standards for individual states. Not only are they effective at developing students' fluency, they are useful in covering a range of challenging texts including those assigned for language arts, social studies, and science. The small-group procedures can be used with disfluent readers at any grade level.

## **2. Fluency Oriented Reading Instruction (FORI) and Wide FORI**

When considering effective approaches for your whole class, FORI and Wide FORI have an extensive research base. Both are designed for the primary or shared reading selection for a given week. However, FORI uses a single text over five days, whereas Wide FORI makes use of three selections [17]. After reading through the description and discussion, you can decide which is a better fit for you.

### *2.1. Fluency-Oriented Reading Instruction (FORI)*

FORI [18] was originally designed in response to a district mandate that all classroom instruction be conducted using grade-level texts. Teachers recognized that this would be problematic for their struggling readers, so they teamed up with a researcher to develop a lesson plan around these selections. Since they did not want to set students up for failure, they decided to integrate scaffolding along with repetition to increase their students' access to the text. While the teachers in the initial implementation used a core reading program, the approach has been replicated using literature anthologies as well as trade books (e.g., [17]). Notably, the second graders who participated in the initial study saw an average growth of 1.8 years in the first year and 1.7 years in the second year [18] according to results on the Qualitative Reading Inventory [19].

The FORI lesson plan is based upon an easy to implement a five-day schedule (see Table 1). However, there are some important provisos regarding the lessons. First, one of the most important goals is to increase the amount of time students spend reading connected text. Given that students need to read between 20 and 30 min, short selections should not be used. Instead, books or stories that are typical in length for second or third grade are most appropriate. Next, when teachers fail to pay attention to implementing the procedure in a purposeful way, it ceases to be effective. This is especially important given the structure of the approach which children enjoy, but which can feel monotonous to teachers. However, it is also important to bear in mind that the procedure allows students to read challenging material and make accelerated progress, so it is worth enduring a little teacher tedium. On the plus side, the regular structure can reduce the pressure to create new lesson plans each week, allowing teachers to focus on vocabulary and comprehension development instead. The day-by-day lesson plan is presented below.

**Table 1.** FORI lesson plan.

Monday	Tuesday	Wednesday	Thursday	Friday
<ul style="list-style-type: none"> <li>- The teacher uses pre-reading activities to introduce the selection to the class.</li> <li>- The teacher then reads the selection to the class, students should follow along on their own copies.</li> <li>- The teacher and students discuss the selection, thereby keeping the focus on comprehension.</li> </ul>	<ul style="list-style-type: none"> <li>- The teacher and students echo read the selection.</li> <li>- The teacher should integrate comprehension and vocabulary strategies throughout the reading.</li> <li>- Optional: Discussion of the selection can continue.</li> </ul>	<ul style="list-style-type: none"> <li>- The teacher and students choral read the selection.</li> </ul>	<ul style="list-style-type: none"> <li>- The students partner read the selection while the teacher monitors and supports their reading.</li> </ul>	<ul style="list-style-type: none"> <li>- The students complete extension activities designed to broaden their understanding of the text.</li> </ul>
Time required: approximately 40 min	Time required: approximately 30 min	Time required: approximately 20 min	Time required: approximately 30 min	Time required: 30–40 min

DAY 1—Introducing the Text. The primary goal for the first day is to introduce the text that the students will be reading over the course of the week. This usually begins with the selection of a pre-reading activity and may include making predictions, discussing critical vocabulary, or building background knowledge. For example, if you were reading about Mae Jemison, you might introduce terms like astronaut and space shuttle, talk about some of the work that occurs at NASA, or ask your students to think about the kinds of challenges faced by individuals who explore outer space. The instruction should also be designed to build student interest and motivation.

The next step involves reading the selection aloud to the class. At this point, it is critical that the students follow along in their own copies of the text. One way to help ensure the students are on-task is to circulate around the room, making sure they are following along. Your fluent reading of the selection is important for two reasons. In terms of mechanics, it provides students with a model of what their reading should sound like and allows them to look at the words as they are being pronounced without having to decode them independently upon initially encountering them. Second, it allows them to listen to the entire text before they have to read it, keeping the focus on meaning. The read-aloud should be followed with a discussion that will help the students grapple with their understanding of the selection and reinforce the notion that comprehension is the primary goal of reading.

DAY 2—Echo Reading. The second day involves an echo reading of the selection. This procedure involves reading a section of text and having the class read it back. If the class is not familiar with this procedure, start with one or two sentences at a time. While students will eventually be able to read it back independently, it is helpful to read along with them as they develop this ability. Next, as students get used to the concept of echo reading, it is important to move them toward longer sections of text. A paragraph or two is usually a good length since it is too long for students to rely on their short-term memory, but not so long that they will lose track of what they are reading. Eventually, however, they may be able to echo read as much as a page at a time, although that will depend on the layout of the book and the amount of text on a page. As is the case on the other days, it is helpful to circulate around the room to help students stay on task. Depending on the complexity of the material, Day 2 can also have a focus on comprehension. This can prevent students from perceiving the purpose of the echo reading as simply word identification. Any comprehension activity that focuses on the meaning of the text, from interspersing questions throughout the reading to some form of discussion to a written response, would be appropriate (e.g., [20]).

DAY 3—Choral Reading. On Day 3, the students and teacher read aloud the selection simultaneously or chorally. Since this is the third time the text is being read, it is particularly important to maintain your energy in terms of reading fluidly and expressively. As was the case on the previous days, it also continues to be important to circulate around the room to help students maintain their focus and pacing. However, as they get more acquainted with the lesson format,

they will improve their ability to attend to the reading. Since the third reading takes the least amount of time, there should be plenty of time remaining for literacy activities that extend beyond the week’s primary selection.

**DAY 4—Partner Reading.** On Day 4, the students work in pairs to read the selection for the final time. Partner reading is saved for last because it provides for the least amount of support, so the students need to have established a degree of comfort with the text, something which should have occurred over the previous three days. When it comes to determining pairs, the two best approaches are self-selection, or allowing the students to choose who they want to read with themselves, and assigning partners across ability levels [21]. When assigning readers, it is important for a difference in achievement to exist between the two readers, but that difference should not be too great. If the abilities are too disparate, the more or the less skilled reader (or both) is likely to experience frustration with the process.

The simplest approach to rank readers is to list students from the highest achieving reader to the student experiencing the greatest difficulty (e.g., [22]). You should then divide the list in half, and place the first name from the second list next to the first name on the first list and so forth (see Table 2). This ensures that, in terms of reading development, your most skilled reader is partnered with a reader from the middle of the class, and the reader who is having the greatest difficulty will also be partnered with an average reader—keeping the difference between students relatively equal for all pairs.

**Table 2.** Grid for determining partners.

Skill Rank	Name	Skill Rank	Name
1	Bianca	11	Nichelle
2	Theo	12	Lilly
3	Miguel	13	Erica
4	Asia	14	David
5	Thad	15	Sydney
6	Maxwell	16	Lee
7	Hazel	17	AJ
8	Xander	18	Marco
9	Krissie	19	James
10	Bernard	20	Topher

In terms of the reading itself, each partner should read alternating pages or paragraphs. Since the students have already read this material at least twice (and followed along on an additional reading), they should be able to provide one another support and coaching if either experiences difficulty. However, they should feel free to ask for help as needed. When a reader gets to the end of a page, they should finish any sentence or paragraph even if it continues onto the next page. The partner should then take over the reading of the selection. If partners complete the first reading of the text and there is enough time, they can switch assigned pages and read it for a second time.

**DAY 5—Extension Activities.** Day 5 is set aside for extension activities that can be used to develop a deeper understanding of the text. This is important for developing skills such as student-led discussions, writing responses, constructing charts and diagrams, or any other approach that helps learners better comprehend what they have read. Since students will need to refer back to the selection to complete many of these activities, this can be a powerful opportunity to teach them the type of skills required by the Common Core State Standards (CCSS) [23] or the literacy standards used in a particular state.



2.2. Wide Fluency Oriented-Reading Instruction (Wide FORI)

Wide Fluency-Oriented Reading Instruction or Wide FORI [17] differs from FORI in terms of the number of texts that students will read in a five-day lesson plan (three as opposed to one; see Table 3). Despite this difference, the two approaches follow similar formats, are both easy-to-implement, are designed to ensure students spend an extensive amount of time reading connected text, emphasize comprehension, and have a solid research-base. Moreover, because both approaches use challenging texts, students are introduced to a variety of concepts and vocabulary that would not be accessible if they were limited to reading instructional level texts.

When thinking about these approaches, it is important to consider what happens when students either read a single text repeatedly or read several selections for an equivalent amount of time. Since both procedures involve reading connected texts, students encounter an extensive number of words, phrases, and concepts—allowing them to develop better fluency and improved comprehension [24]. Having already discussed FORI, the day-by-day lesson plan for Wide FORI is presented below.

Table 3. Wide FORI lesson plan.

Monday	Tuesday	Wednesday	Thursday	Friday
Text #1	Text #1	Text #1	Text #2	Text #3
<ul style="list-style-type: none"> <li>- The teacher uses pre-reading activities to introduce the selection to the class.</li> <li>- The teacher then reads the selection to the class, students should follow along on their own copies.</li> <li>- The teacher and students discuss the selection, thereby keeping the focus on comprehension.</li> </ul>	<ul style="list-style-type: none"> <li>- The teacher and students echo read the selection.</li> <li>- The teacher should integrate comprehension and vocabulary strategies throughout the reading.</li> <li>- Optional: Discussion of the selection can continue.</li> </ul>	<ul style="list-style-type: none"> <li>- The students complete extension activities designed to deepen their understanding of the text.</li> </ul>	<ul style="list-style-type: none"> <li>- The teacher and students echo read a second selection for the week.</li> <li>- The teacher should integrate comprehension and vocabulary strategies throughout the reading.</li> <li>- Discuss selection.</li> </ul>	<ul style="list-style-type: none"> <li>- The teacher and students echo read a third selection for the week.</li> <li>- The teacher should integrate comprehension and vocabulary strategies throughout the reading.</li> <li>- Discuss selection.</li> </ul>
Time required: approximately 40 min	Time required: approximately 30 min	Time required: 30–40 min	Time required: approximately 30 min	Time required: approximately 30 min

DAY 1—Introducing the Text. The first two days of Wide FORI parallel the first two days of the FORI procedure. After selecting the primary text for the week, you begin by introducing it with your typical pre-reading lesson. These can include vocabulary development, building background knowledge, and making predictions, they should also help to build interest and motivation for reading. The next step involves reading the text aloud to the students as they follow along in their own copies. As is the case with Day 1 of FORI, this allows them to hear an expressive, fluent reading of the text without having to decode the words the first time they encounter them. It is also important to circulate around the room as a way to monitor the students and redirect those who may need redirection. After completing the reading, a discussion should take both to help students develop a deeper understanding of the selection and to emphasize that the construction of meaning, not word recognition, is the central goal.

DAY 2—Echo Reading. Day 2 of the Wide FORI lesson plan again parallels Day 2 of the FORI procedure to a large degree. The lesson starts with an echo reading of the text that was introduced on Day 1 (see Day 2 of FORI for details on implementing the echo reading procedure). To maintain a focus on meaning, comprehension strategies should also be used during or following this second reading of the material. Discussion, questioning, and summarization are good examples of the type of activity that can occur at this point. The difference between the two approaches occurs at the end of the lesson, in that a partner reading of the text can take place if time permits (see Table X.2 for an example of how students can be partnered).

DAY 3—Extension Activities. The first major divergence from the FORI format occurs on Day 3. Rather than undertaking an additional reading of the selection, extension activities are scheduled for this day. Again, any activity designed to help students delve deeper into the text can be used (e.g., graphic organizers, discussions, or written responses). Given less time is spent on this material, it is critical that students have a solid understanding of what they read by the end of the third day, even if it means devoting a slightly greater proportion of your literacy block to its comprehension.

DAYS 4 and 5—Echo Reading. The fourth and fifth days incorporate a second and third text. Since an echo-reading of each text is required as part of the lesson, there is a limited amount of time available to spend on the pre- and post-reading activities. Given these time constraints, it is important to consider exactly what additional instruction should be used and how to best extend students’ understanding of what they read. This can best be accomplished by carefully matching activities, such as vocabulary development, discussion, or summarization, to the instructional goal. As with Day 2, if there is time available on Days 4 or 5, the students can partner read that day’s selection.

**3. Fluency-Oriented Oral Reading (FOOR) and Wide Fluency Oriented Oral Reading (Wide FOOR)**

Should you be working with small groups of students who need additional fluency support when compared to their peers, Fluency-Oriented Oral Reading (FOOR) and Wide Fluency-Oriented Oral Reading (Wide FOOR) are two research-based approaches that integrate the principles discussed earlier in this paper [25]. These interventions were designed to further examine the finding that it is the reading of connected text, rather than the repetition per se, which ensures readers become fluent [4]. In other words, students who read for a given amount of time, whether by using multiple selections or by repeatedly reading a single selection, made equivalent gains in automaticity and prosody. These approaches differ from FORI and Wide-FORI in that they are designed for small groups of struggling readers rather than for a class as a whole. As such, they are perfect for either small-group work or as a Tier II intervention.

The research intervention was originally designed for four groups of five or six second graders. These groups met three times a week for 15–20 min per session, and all of the students were identified as struggling readers by their teachers. This assessment was confirmed when the Test of Word Recognition Efficiency (TOWRE) [26] and the Qualitative Reading Inventory-II [19] were used as pre-tests (the same measures were also used as post-tests. The Fluency-Oriented Oral Reading group (FOOR) echo or choral read a single title three times over the course of a week (see Table 4), whereas the Wide Fluency-Oriented Oral Reading group (Wide FOOR) echo or choral read three different titles during their weekly lessons (see Table 5) [25]. A third group listened to a fluent reading of the Wide FOOR titles, and a fourth group only participated in the pre- and post-testing (i.e., they did not receive any additional reading instruction beyond that already taking place in their literacy curriculum). The texts selected were considered to range from late first grade to early third grade levels according to Fountas and Pinnell’s ratings [27], and titles such as *Hooray for the Golly Sisters* [28], *The Case of the Cat’s Meow* [29], and *Whistle for Willie* [30] were included in the study. While these books were considered challenging for the students, they were able to read them successfully since the instruction was heavily scaffolded.

**Table 4.** Fluency-Oriented Oral Reading (FOOR) lesson plan.

Monday (approximately 20 min)	Wednesday (approximately 20 min)	Friday (approximately 20 min)
<ul style="list-style-type: none"> <li>- Echo read text for the first time</li> <li>- Comprehension activities should be included, but brief, especially on the first day</li> </ul>	<ul style="list-style-type: none"> <li>- Choral read the material (if the students need additional support, echo read instead)</li> </ul>	<ul style="list-style-type: none"> <li>- Students partner read the selection (if the students finish early, they can begin a second partner reading, even if they are not able to complete it)</li> </ul>

**Table 5.** Wide FOOR lesson plan.

Monday (around 20 min)	Wednesday (around 20 min)	Friday (around 20 min)
Echo read the <b>first</b> text. Briefly discuss the material as part of the lesson.	Echo read the <b>second</b> text. Briefly discuss the material as part of the lesson	Echo read the <b>third</b> text. Briefly discuss the material as part of the lesson

The study yielded important results that can be used for small group fluency instruction [25]. When the students were post-tested on the TOWRE and the QRI-II, students in both the FOOR and Wide FOOR groups scored better than the other students in terms of word recognition in isolation, prosody, and the number of correct words read per minute (automaticity) in connected text. However, the students in the Wide FOOR group made greater gains in comprehension than did their peers who were in the FOOR group. It seems that this outcome may be reflective of the types of reading the FOOR and the Wide FOOR groups undertook. Since repetition was used during the FOOR intervention, the students may have viewed the re-reading process as a way to improve their word recognition and prosody, in other words, they might have focused on their accuracy and how they sounded when reading aloud. Since the students in the Wide FOOR group read a different book at each session, they are more likely to have concentrated on making sense of what they were reading, rather than just on how their oral reading sounded. While these differences are implicit, researchers have found similar results in other interventions [31,32]. In fact, it seems that simply asking students to focus on the meaning of the material they are reading results in increased comprehension. As such, it is important to remind readers that they should focus on the meaning of the text, even when they are learning to decode or trying to develop their fluency [11].

Given the above findings, there are several takeaways for small group fluency instruction [25]. First, whether you base your intervention on repetition or wide reading, it is essential that students spend a significant amount of time reading connected text. Each FOOR and Wide FOOR session incorporates 15–20 min of reading in addition to the reading instruction that was already occurring in the classroom. Second, the text being read needs to be challenging for the students. This does not mean the students should feel frustrated, but they need to be reading material that is between 85%–90% accuracy since they are receiving significant support. Further, it is important to re-evaluate the reading material every few weeks to determine how well students are reading and to move them to more challenging selections when the texts become too easy. By evaluating student learning in this way, it will be easier to determine when students no longer need additional fluency support. At that point, they will more likely benefit from alternative forms of instruction that focus on other key competencies of reading. It is also important to remember that, while this approach was used with groups of five-to-six students, it can be used in smaller groups, with pairs of students, or even in a one-to-one tutorial format.

### 3.1. Fluency-Oriented Oral Reading (FOOR)

**DAY 1—Introducing the Text.** The primary purpose of the first day is to echo read the selection (see the section on FORI and Wide FORI for the echo reading protocol). Since time is limited (15–20 min), comprehension instruction should be brief. It can involve a short introduction, be embedded in the reading, or involve a post-reading discussion, but it should not be the primary focus of the lesson or the main use of the time available. On the other hand, as was noted above, it is especially important that students who participate in a repeated reading intervention are reminded that understanding is the primary goal of reading [25].

**DAY 2—Choral Reading.** The second day incorporates a choral reading of the selection, however, if the students need more support with a particular selection, then it is reasonable to echo read the text a second time. Since the students should be somewhat familiar with the material, this is a good time to include questions during the reading, clarify vocabulary, or incorporate a discussion. Again, this confirms the idea that understanding is the goal of reading, while keeping fluency at the fore. However,

the essential aspect of the lesson is the re-reading of the selection, so this should take precedence in terms of time.

**DAY 3—Partner Reading.** The third reading of the text occurs on Day 3. Students should partner read the selection since this requires them to take responsibility for the entire text (See the section on FORI for ways to create and implement partnerships). Since there will be a maximum of three pairs in any group, it should be relatively easy to monitor the students and assist those who are having difficulties. If there is enough time, the students can re-read the text one more time, preferably reading the pages they listened to the first time through. If there is an uneven number of students, the teacher or another adult should act as a partner.

### *3.2. Wide Fluency-Oriented Oral Reading (Wide FOOR)*

As is the case with FOOR, the time per session is limited (between 15–20 min) [25]. However, since you will be reading a new selection each time you meet, it is even more important that you complete the echo reading within the time allotted (see the FORI section for a discussion of echo reading). As a result, any comprehension instruction should be relatively brief. However, predictions, vocabulary, and questions strategically interspersed within the selection are all appropriate choices, as are many others. Since a different text is read at each session, this approach lends itself especially well to a post-reading discussion—as long as the reading is completed. It is also critical to remember that, as students become increasingly fluent, it is necessary to increase the level of challenge. This process should continue until the students are reading grade-level material comfortably. Once students have achieved this milestone, you should consider whether additional fluency instruction should be undertaken or whether the time would be better spent on other focal areas of reading instruction.

Since the students will be reading a new text each time they meet, it is useful to think about whether the weekly material should be connected in some way (e.g., author, subject, or theme). While this is not necessary, it can serve to strengthen students' vocabulary and conceptual knowledge (e.g., [12,33]). Another issue involves finding enough appropriate material. Thankfully, there are usually texts available in the school building or via the Internet. For example, sets of books can be gathered from a guided reading program, selections can be taken from commercial core programs that are no longer being used, and copies of unused trade books can often be found in storage. In addition, student magazines and child-friendly websites often have substantial articles on subjects that are of interest to young learners. The critical elements to bear in mind when choosing texts are that the material should always be challenging for the students, every student must have their own copy, and what is being read needs to be engaging for students.

### *3.3. Future Directions for Research*

When considering the above instructional approaches, it is important to note that they were all used with second graders, either for whole class instruction (FORI, Wide FORI) [17] or with small groups of struggling readers (FOOR, Wide FOOR) [25]. This does not mean they will not work with other learners—there is a substantial research base indicating similar approaches are effective with older struggling readers (e.g., [4,14]). However, it is also important to note that there is a need for research to confirm the effectiveness of these approaches with other groups of learners. Similarly, the selections being used were either exclusively (FOOR, Wide FOOR) [25] or predominately (FORI, Wide FORI) [17] fiction materials that were either part of the literacy curriculum or requested by the teachers. As such, future directions for research include determining the effectiveness of these approaches for other grades and with other types of texts. Results from any adaptation of the lesson plans will help determine their usefulness beyond the examples presented here.

## **4. Conclusions**

When considering whether to use a whole class approach to fluency development or an approach designed for smaller groups of disfluent readers, it is important to consider students' developmental

needs [8,11]. For example, it is rare that an entire class of first graders will be ready for fluency instruction. Similarly, most students beyond the third grade should be fairly fluent readers. In both of these scenarios, small group instruction using FOOR or Wide FOOR is appropriate for those learners mentioned, but is unlikely to benefit the entire class. In fact, these approaches are efficient and effective ways to meet various students' needs as they develop and change throughout the school year. By using a flexible grouping structure, you can vary your curriculum so that oral reading instruction is targeted to those who need it the most.

On the other hand, it is the case that most, if not all, second and third graders could benefit from the type of whole-class fluency instruction provided by FORI and Wide FORI. These approaches have a solid scientific research base, have been proven to increase students' fluency and overall reading achievement, and are an effective way to teach the shared reading component of a literacy block. However, it is also important to remember that even the best oral reading instruction should not be the entirety of a literacy curriculum. Further, once students are fluent readers, these approaches should be afforded less time and priority in the curriculum, or even phased out entirely. Instead, additional silent reading and comprehension instruction, writing activities, and/or opportunities to expand your students' reading of different genres and in different content areas should take precedence. In this way, it becomes possible to create literacy instruction that will meet the needs of all students.

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Article

# Impact of Classroom-Based Fluency Instruction on Grade One Students in an Urban Elementary School

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**Abstract:** The present exploratory study examined the effect of the implementation of a reading fluency instruction protocol on the reading performance of early first grade students in an urban school. Previous research has tended to examine the effects of fluency instruction after students have achieved some degree of competency in word recognition, usually toward the end of first grade and beyond. The fluency instruction provided in this study included repeated and assisted reading and was delivered daily over a ten-week period in the first semester of the school year by classroom teachers. The reading performance of students in the fluency instruction group ( $n = 51$ ) was compared with a comparable group of first grade students ( $n = 27$ ) who did not receive the fluency instruction, though the total number of minutes devoted to daily reading instruction and home reading was equal between groups. Descriptive analyses of pre- and post-testing data suggest that the first grade students receiving the fluency instruction made substantive, but not statistically significant, gains in reading achievement over the comparison group of students not receiving fluency instruction. The results suggest that dedicated and systematic fluency instruction may be appropriate for students before high levels of word decoding are achieved and that fluency instruction may be an effective instructional protocol as early as the beginning of first grade. Given the acknowledged limitations, including small sample size, further research into fluency instruction in early first grade is recommended.

**Keywords:** reading; fluency; fluency development lesson; comprehension; academic achievement

## 1. Introduction

Lack of adequate progress in reading achievement among elementary grade students in the United States continues to be a major concern. The most recent (2019) National Assessment of Educational Progress (NAEP) [1] reported that 34% of children entering kindergarten are lacking in basic language skills that promote reading acquisition and 64% of fourth graders read below grade level. Moreover, these statistics have not changed substantially over the past 25 years. This stagnation in reading growth leads to a probable conclusion that instructional factors that promote early reading development are either missing or are receiving less-than-optimal emphases in many curricular reading programs.



This is not a new idea, that something of extreme importance is missing in our reading instructional programs to promote and support foundational reading development. Allington [2] proposed that a viable reason for so many students struggling in reading is that they are not fluent readers and fluency is often a relatively neglected component in reading instruction curricula and instructional protocols. He claimed that the ability to read with ease and expression, that is reading fluency, is often observed as lacking in struggling readers. Furthermore, fluency is essential to competent reading and that reading educators, curriculum developers, and policy makers should make it an integral part of their theoretical models of reading and reading curricula in the elementary grades.

The theoretical underpinnings to fluency lie in the work of LaBerge and Samuels' [3] theory of automatic information processing in reading, Logan's [4] instance theory of automatization, and Perfetti's [5] verbal efficiency model of reading. LaBerge and Samuels posit that reading is a multi-task activity. Two of the major tasks in the act of reading are word recognition and comprehension. They also argue that readers have a limited amount of attentional or cognitive resources. When readers have to employ a large amount of their attentional resources to the word identification reading task, they have less available for comprehension. As a result, comprehension suffers. The solution to this problem is to automatize word recognition. By automaticity, LaBerge and Samuels mean the ability to recognize most words instantly and effortlessly in the way that most proficient readers do. By minimizing the amount of attentional resources required for word recognition, readers can then apply those resources to comprehension. Stanovich [6] further elaborated on the LaBerge and Samuels theory by suggesting that difficulty, or a lack of fluency, in reading could be explained by a lack of automaticity in the bottom-up word decoding process, which restricted those readers in employing their cognitive resources for the more cognitive demanding top-down reading comprehension process.

A complementary theoretical perspective on fluency comes from work in the prosodic components found in oral reading [7–12]. This perspective suggests that reading fluency is achieved when readers are able to embed in their oral reading prosody or expression that reflects syntactic and semantic aspects of the text being read. Confirmatory research has subsequently found that prosody is associated with proficient reading [13–17].

Reading fluency has since been accepted as a key competency in reading development and instruction as suggested by the Report of the National Reading Panel [18], comprehensive reviews of reading fluency [19–23] and in policy documents in the United States such as the Common Core State Standards [24].

Despite this seeming consensus about the importance of fluency, it continues to receive somewhat limited emphasis in actual reading instructional protocols in the United States [25]. Rasinski [26] notes that in the annual "What's Hot" survey of reading scholars, reading fluency has consistently been identified as a "not hot" topic. Moreover, these same scholars report that reading fluency does not deserve to be a hot topic. Indeed, in the most recent survey [27] reading fluency was not even included.

Rasinski [26] suggests that there are several reasons for the limited emphasis on fluency instruction in reading curricula. Fluency is most often associated primarily with oral, not silent, reading and automatic word recognition is often mischaracterized as reading fast. Moreover, there is a widespread view that it is a competency that is only important in the primary grades. Another inaccurate view of fluency is the dissociation of it with reading comprehension, which of course is the ultimate goal of reading. Each of these characterizations is incorrect; reading fluency is indeed an essential piece for proficient reading, ranging from foundational skills through competent reading. Investigations of reading in the early 20th century [28] recognized that fluency enables the mind of the reader to move from a text level focus to a meaning level focus. Fluency promotes increasingly efficient (automatic) word identification that allows the reader to devote more cognitive resources to comprehension [29,30]. Still, a prevailing attitude in many reading instructional programs is that fluency does not deserve high status among priorities in teaching reading.

## **2. Defining Fluency**

As mentioned earlier, fluency in reading is a complex competency, made up of two distinct sub-competencies. One sub-competency is word recognition automaticity, which refers to the ability of readers to instantly recognize written words and phrases, with minimum cognitive effort. The significance of this competency is that with automaticity readers are able to reserve their finite cognitive resources for reading comprehension [4,31]. Word recognition automaticity is a problematic concept in that it is not the same as and can be confused with word recognition accuracy. Although a reader may be able to decode words accurately, this is not the same as decoding words automatically. A reader who is automatic in word recognition identifies words instantly from lexical memory without the need to apply cognitive resources for decoding [32,33]. Simply becoming proficient in phonics or word decoding is not sufficient for fluent reading. Such accurate readers often read in a slow and effortful manner that limits the amount of cognitive resources that can be devoted to comprehension. Literacy professionals who advocate phonics only for proficient reading miss the point that accuracy in word recognition is a necessary but still insufficient condition for accomplished reading. It is automaticity in word recognition that is the ultimate goal when it comes to word decoding and foundational reading competency [24]. Automaticity is typically assessed by speed of reading. Readers who read faster are assumed to be fast because they are able to recognize words automatically. A good deal of research has associated speed of reading with comprehension and overall reading achievement [19] and it has become a fairly common assessment tool in general reading instruction.

The second component of fluency is prosody or expression during oral reading [19,21,22,34]. Indeed, fluent speech is often characterized by the extent to which speakers are able to use prosodic or melodic elements of their voices to assist in communicating meaningful messages; in other words, their reading sounds like real language. Similarly, a reader's use of prosody while reading orally provides evidence that the reader is monitoring and capturing the meaning of the written text. Prosody is normally assessed informally in a classroom setting by a teacher listening to the oral reading of a text and then rating the reading according to a descriptive rubric. Research on prosody has demonstrated that it is associated with comprehension and overall proficiency in reading [14,15,34–36].

## **3. Teaching Fluency**

Since the automaticity component of fluency presupposes accuracy in word recognition, the conventional wisdom is that fluency instruction should normally occur at the same time, or subsequent to phonics instruction. Several scholars describe essential approaches to fluency instruction that include modeling fluent reading for students, assisted reading where a student reads a text while simultaneously hearing a fluent rendering of the same text, wide reading practice, dyad or paired reading, and deep or repeated reading practice where a student practices a text multiple times until the student's reading reaches fluency [37–40].

A more intensive approach to fluency instruction involves integrating those separate elements describe above in a comprehensive lesson format. The Fluency Development Lesson (FDL) was developed as such an approach for students deemed at risk for fluency acquisition [37]. The FDL is a daily lesson that has as its goal fluent reading of a new text, usually a poem. In the FDL the teacher chooses a new brief text each day for students to practice to the point of fluency. Poems for children are ideal for this activity as their brevity along with the rhythm and rhyme in the poems make them easy for students to master. Two copies of each daily text are made for every student. A display copy is also provided for students to view and read as a group. Teachers select their daily poems from a variety of online resources and stocks of poems available in the school. Poems are selected based on their perceived interest to students and a general sense that the poems are in a readable range for students. More challenging poems could be selected with the understanding that students would require more support in order to achieve mastery of them.

The teacher begins each 20-minute FDL by reading with students the text mastered from the previous day. Then, focus changes to the new text where the teacher reads the text aloud to the

students two to three times while the students follow along silently. The teacher changes the manner in which they read in order to allow students to consider various styles or versions of oral reading. After the text is read aloud, the class engages in a brief discussion of the text and how it was actually read. Next, students read the text chorally two to three times, in various forms, along with the teacher. Again, the teacher creates variety by asking different groups of students to take the lead in the choral reading. Following choral reading, students work in groups of two or three to continue practicing the text. One student reads the text two to three times while the partner student follows along, provides assistance when necessary, and tells the reader what was liked about the reading; then the roles are reversed. During this portion of the lesson the teacher walks around the classroom coaching, supporting, and giving formative feedback to individuals and groups of students as needed while other students continue to rehearse. At this point in the lesson, students have read the daily text six to twelve times. In order to provide an incentive for that amount of practice, individual students and small groups are then asked to perform their text for their classmates, other classrooms, or other members of the school community. The focus of the performance is on prosodic and meaningful readings of the text.

Following the performance of the text by students, they are engaged in a brief word study activity. Eight to ten words from the text are chosen by the teacher and students. Students read the words in isolation and then engage in one of several word work activities, which include analyzing and expanding on rhymes found in words, word sorts, and word games.

The lesson ends with students archiving one of copy of the text in their folders. The other copy of text is sent home for additional practice with parents and family members. Parents are alerted prior to the implementation of the FDL about the importance and need for continued practice and repeated readings at home. They are encouraged to make a special effort to listen to their children read and provide positive feedback on their reading. The following day the FDL procedure is repeated with a new text.

Research has shown that multi-feature fluency interventions, such as the FDL, have been effective in improving various aspects of reading, including reading comprehension [19]. A meta-analysis by Stevens, Walker, and Vaughn [23] examined 19 studies between 2001 and 2014 on the impact of various fluency interventions on elementary-grade students experiencing learning difficulties. They concluded that repeated reading, assisted reading, and multi-feature interventions produced significant improvements in both students' fluency and comprehension. Other studies employing specifically the FDL have demonstrated improvements in various reading competencies (word recognition accuracy, automaticity, prosody, and comprehension) for second graders [41], third graders [42], fourth graders [43], and students in a clinic reading intervention setting [44,45].

Phonology and explicit phonics instruction should be the primary focus of instructional activities for developing reading foundational skills in grade one [46–48] and it has been generally thought that fluency instruction should proceed after students have achieved some degree of competency in word recognition. Research has not generally focused on the effects of the use of the fluency instruction, including the FDL, in conjunction with foundational skills instruction. The present study examined the effects of the regular use of FDL in self-contained first grade classrooms. The study used a general reading growth measure to determine the effects of the FDL instruction.

## **4. Methods**

### *4.1. Setting and Participants*

The present study took place at a charter school located in the urban core of a large midwestern U.S. city, in what was once an industrial factory. Ninety-eight percent of the student body is non-white (89.5% African American, 5.4% Asian American, 1.6% Hispanic American, and 1.9% multiracial). Consent to participate in the FDL was given by parents. One hundred percent of the students received free lunch. Subjects for the study were students from three first-grade classrooms at the Village Prep

School. Students in two of the classrooms ( $n = 51$ ) were identified as the treatment (FDL) group while students from the other classroom ( $n = 27$ ) were selected as a business-as-usual comparison group. Students had previously been randomly assigned to the three classrooms.

The impetus for the study came from the school principal and reading specialists who recognized that the demographics of the school population were likely to put students at risk for difficulties in reading. The principal and reading specialists were on the lookout for instructional innovations that might help students. The study, then, took place within an ecologically valid setting.

All elementary grade teachers in the school were provided with an overview of reading fluency, the FDL, and a demonstration of the FDL in practice. The total time for the training was 90 min. Although all teachers were trained in the FDL, teachers in the control or business-as-usual classroom agreed not to use it during the span of the study. The teachers who implemented the FDL were volunteers and indicated to the reading specialists a willingness to implement the FDL daily in their classrooms. The reading specialists regularly observed both the business-as-usual and FDL classrooms to ensure that the FDL was not part of the business-as-usual classroom and that the FDL was an integral part of the FDL classrooms.

#### *4.2. Treatment*

Each day all first-grade students received instruction in reading for 135 min from early October through mid-December (10 weeks). Students in the business-as-usual group received daily instruction in phonics (25 min), computer-based instruction (25 min) that included activities involving specific word decoding and comprehension competencies, independent reading of picture books (25 min), guided reading using authentic texts with teacher-led discussions (25 min), and standards-based reading instruction focused on discrete reading competencies found in the standards document issued by the state education agency (35 min). Fluency instruction was a tangential aspect of the business-as-usual (BAU) curriculum and occurred on an informal and irregular basis. That is, the teachers occasionally involved students in repeated and assisted reading activities; however, these were usually unplanned events that occurred irregularly. For example, realizing that students had difficulty with an assigned text, the teacher might ask students to read it a second time. Similarly, during regular guided reading instruction the BAU teacher may occasionally ask pairs or small groups of students to read a portion of a text chorally. In none of these instances was the fluency activity planned as part of a regular and systematic approach to fluency instruction.

For students in the FDL classrooms, phonics, computer instruction, independent reading, and guided reading were each reduced by 5 min, resulting in a 20-min daily period available for implementation of the FDL. Total time for reading instruction, then, was the same for both groups. In order for students to receive the FDL within the allotted and limited time, each Fluency Development Lesson was administered to the entire class (25 and 26 students respectively).

All students were asked to engage in a brief period of reading (10–15 min) at home. For the BAU students, parents were asked to read to their children and/or listen to them read passages that they had read at school or passages chosen for independent reading. In the FDL groups, students were asked specifically to engage in repeated oral readings or performances of the text from the daily Fluency Development Lesson to various members of their families.

### **5. Measures**

All students were assessed by the school's reading specialists prior to the beginning of the treatment and again in January at the end of the treatment using the Benchmark Assessment System (BAS) [49]. The BAS was chosen as it was the assessment system normally used by the school to measure students' reading progress. The BAS is an individual formative reading assessment in which students are asked to orally read and respond, in a comprehension conversation with the examiner, to a series of graded texts. Data are gathered on students' word recognition accuracy, fluency, and reading comprehension. The examiner uses the accumulated data to determine each student's instructional

and independent reading levels. Reading levels are specified in alphabetical levels (Levels A through J for grades K-1). The BAS had been used in this school for more than five consecutive years.

A published study of reliability and validity reports that the texts used in the BAS are progressively more difficult and that approximately 80% of K-2 students’ reading performance of the graded texts followed the sequential hierarchical order. According to the Field Study of the Reliability and Validity of the Fountas and Pinnell Benchmark Assessment Systems 1 and 2 test–retest reliability for all BAS (0.94) levels ranges from 0.93 to 0.97. Convergent reliability indicated the BAS was highly predictive of Reading Recovery Assessments (0.94) and moderately predictive of the Slosson Word Test (0.69). The same study also reported a strong correlation ( $r > 0.91$ ) between the BAS text levels and texts in the Reading Recovery Text Level Assessments [50]. Overall, the BAS is reported to be a valid and reliable means for assessing students’ reading levels.

**6. Results**

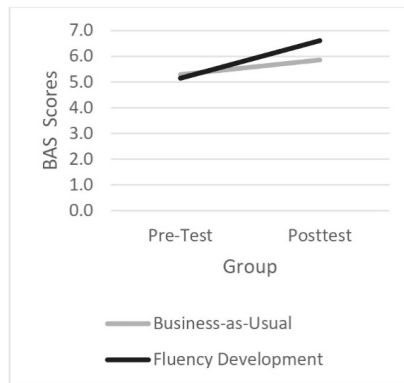
Table 1 shows the means and standard deviations by group for the October (pre) and December (post) assessments. Table 2 further describes the differences in performance by group. To determine if statistically significant differences occurred due to treatment, a repeated-measures analysis of variance (ANOVA) was conducted where the group composed the between-subject factor (BAU and FDL) and the BAS assessments for October and December formed the within-factor. Effect sizes for partial eta-square were interpreted using guidelines from Kirk (1996). Results from the multivariate test using Pillai’s Trace showed that all students made statistically significant gains,  $F(1,68) = 67.37, p < 0.001, \eta^2 = 0.498$ . The test for differences between groups was not significant,  $F(1,68) = 0.179, p = 0.674$ . However, the interaction test for simple effects (time-by-group) resulted in statistically significant results with large effects,  $F(1,68) = 12.91, p = 0.001, \eta^2 = 0.160$ . A closer look reveals a 0.14 difference in the pretest means of the two groups (treatment = 5.15 and control = 5.29) which an independent samples *t*-test showed to be a non-significant difference,  $t(68) = 0.202, p = 0.841$ . When the December means were compared for the BAU and FDL groups, a difference of 0.75 favoring the FDL group was found ( $6.61 - 5.86 = 0.75$ ). This difference between the groups was more than six times greater in December than in October ( $75 \div 14 = 89/14 = 6.4$ ). While the BAU group showed a 13% increase between October and December ( $5.86 - 5.29 = 0.67$ ), the FDL group showed a 28% increase ( $6.61 - 5.15 = 1.46$ ), a result 2.2 times greater than the BAU group. Figure 1 graphs the results showing that while the two groups began at very similar starting points in October, the FDL group out-gained the BAU group.

**Table 1.** Means (sd) by group for October and December.

Group	Mean (sd)	Gain
October FDL	5.02 (2.72)	
December FDL	6.53 (3.09)	+1.51
October Control	5.29 (2.83)	
December Control	5.86 (3.08)	+0.57

**Table 2.** Pre- and post-test differences by reader group.

	Group			
	FDL		Control	
	Students (%)	Cumulative %	Students (%)	Cumulative %
No Gain	14 (27.5)	27.5	16 (55.2)	55.2
+1 Point	11 (21.6)	49.1	9 (31.0)	86.2
+2 Points	17 (33.3)	82.4	4 (13.8)	100.0
+3 Points	4 (7.8)	90.2	0	
+4 Points	5 (9.8)	100.00	0	
	51 (100.0)		29 (100.0)	



**Figure 1.** Raw score post-test gains by group.

## 7. Discussion

Recent reports in the public media [51,52] have argued that phonics (word recognition) instruction is a necessity for reading success and that current phonics instruction in American schools is inadequate. We agree that proficiency in word recognition accuracy is critical to reading success and that intentional and systematic instruction in phonics is required in grades kindergarten through two. However, mere accuracy in word recognition is insufficient for proficient reading. Given our understanding of the interplay between and cognitive requirements for word recognition and comprehension, the true goal for word recognition instruction should be automaticity in word decoding. For decoding skills to become automatic, fluency instruction that includes regular opportunities for repeated and assisted reading is recommended. Interestingly, neither of the previously mentioned public media articles advocating phonics instruction included reading fluency as a significant part of the recommended instruction or automatic word recognition as the ultimate foundational reading goal.

In Chall's [29] stages of reading development, the foundational reading focus in Stage 1 is decoding and occurs in grades one and two. At Stage 2 the focus of foundational reading moves to fluency and occurs in grades two and three. While we agree with and support the trajectory of Chall's model of word recognition accuracy, we argue that there is no reason why fluency cannot also be developed simultaneously in grades one and two. Perhaps Chall's fluency stage of development may be more appropriately implemented earlier in students' school careers (e.g., grades one–two) and lead to an acceleration in students' reading development.

The results of the present study offer some preliminary insight into challenging the oft-stated suggestion that phonics instruction alone is sufficient for students to achieve mastery of foundational reading. The study also questions the notion that fluency instruction should be delayed until after students have achieved full proficiency in word recognition accuracy (Stage 1). The results of our study suggest that intentional, multi-component fluency instruction along with phonics and word work may provide an additional boost to students' reading achievement greater than phonics alone. Moreover, our results suggest that phonics and fluency instruction can, and perhaps should, occur simultaneously as early as grade one.

Fluency's place in the history of American reading instruction could be viewed as one of benign neglect. Although oral reading recitation was a major component of reading instruction more than a century ago, it was ignored in the later half of the 20th century to the point that by 1983 Allington [2] referred to fluency as the neglected reading goal. Even though fluency did gain some resurgence with its identification as a critical component of effective reading instruction based on the National Reading Panel's [18] evidence-based assessment of the scientific research literature, fluency has continued to be viewed more as a tangential component of the overall literacy curriculum. An analysis of Reading First [25], a U.S. reading initiative in the first decade of the 21st century, whose goal was for all third

grade students to be reading at grade level, found that less than five minutes per day was devoted to fluency instruction, even in schools where there was a commitment to provide instruction in the essential instructional components of reading, including fluency, identified by the National Reading Panel. Reading First failed to achieve the goal of all children reading at grade level, and we are left to wonder if a portion of those disappointing results were due to the fact that fluency was not sufficiently emphasized in instruction.

The results of the present study provide a tentative suggestion that intentional and multi-component fluency instruction, along with phonics, may be an appropriate part of a foundational first-grade reading curriculum. Indeed, recognizing the stagnant growth in reading achievement in the United States, and given the present tentative results in favor of the students receiving fluency instruction, integrating fluency into the first-grade reading curriculum has the possibility of making a significant and substantial impact on improving students' literacy outcomes. The implementation of the FDL required no more than 20 min per day, a time period that could easily be integrated into existing first-grade reading foundational skills instruction.

At a minimum, this study suggests that larger-scale and more in-depth and controlled research into the role of fluency instruction, and in particular the Fluency Development Lesson, on improving reading outcomes in first grade students may be worthwhile. If we are interested in raising reading achievement in the elementary grades, fluency cannot be neglected.

## 8. Limitations

We acknowledge that this preliminary study is small in scale and the results and recommendations are to be understood and taken with caution. We also recognize that in the present study, given the pre-test–post-test design and authentic nature of classroom and school environments in which the study took place, full control of the instruction and variables was not possible. Still, the nature of the results suggests that further study of intentional and multi-factor fluency instruction, such as the FDL, is worthy of continued study. The reading performance of fourth graders continues to stagnate, and fluency instruction persists in being either a neglected or tangential part of many foundational reading curricula. What is needed is a greater scholarly and research focus on reading fluency instruction where it is embedded in foundational reading skills instruction in the early grades. Clearly, the results of this limited and preliminary study point to the need for larger-scale, more in-depth, and controlled studies of reading fluency instruction and interventions.

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Article

# Read Like Me: An Intervention for Struggling Readers

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**Abstract:** The current study reports on a reading intervention method titled Read Like Me. The intervention utilizes a stacked approach of research-based methods, including reading aloud, assisted reading, and repeated reading. The student involved was a second-grade boy reading below grade level who was identified as dyslexic and diagnosed with attention deficit hyperactive disorder. Using a single-case experimental design, the intervention was monitored in four phases, including a baseline, intervention coupled with regular schooling, intervention only, and a return to baseline. The results indicated that the intervention combined with regular schooling improved his reading expression and rate and also his decoding skills, word knowledge, and reading comprehension. In conclusion, the authors offer Read Like Me as one more intervention that may be a viable option for teachers in their effort to support developing readers.

**Keywords:** struggling readers; reading intervention; reading fluency; reading comprehension

## 1. Read Like Me: An Intervention for Struggling Readers

The theory of automaticity essentially purported that the more automatic readers become in word recognition, the more cognitive resources can be reallocated to higher-level reading processes, such as reading comprehension [1]. Stanovich [2] referred to the theory of automaticity as a critical precursor to many important reading theory developments. Decades later, it is still used to frame studies in reading, especially those that examine practiced-based methods [3–6]. The purpose of this study was to explore the effectiveness of a newly developed practice-based reading intervention for struggling elementary readers. The intervention, Read Like Me, is a multifaceted approach comprised of several researched interventions, including reading aloud, repeated readings, assisted reading, and the gradual release of responsibility. In light of the significant impact that the methods have on students' reading, the methods were combined to create a synergistic and potentially effective intervention.

Struggling readers need expert, research-based instruction [7] especially as the expectations grow for young readers. Students are increasingly required to read texts that are too difficult, a requirement that contradicts previous research [8,9]. Gradually, however, that perspective has changed [10], and students are frequently engaged in texts that are far more challenging. Allington [7] adamantly opposes this practice and reminds us that adults would likely refuse to read books at only 98%-word recognition accuracy, which would amount to approximately six unknown words per page. Regardless, here we are putting difficult texts into the hands of struggling readers.

Recently, Strong, Amendum, and Conradi Smith [11] described a similarly dim outlook on the current perspectives on text difficulty in modern reading education. However, the authors continued on to describe some of the research that may help educators consider the appropriate contexts for utilizing challenging texts. Before selecting a text, a teacher should consider the reader and also how much assistance will be provided. Thus, it might be possible for teachers to use difficult texts when administering interventions that provide sufficient supports for the reader.

Read Two Impress (R2I) [12] is an example of an intervention that calls for challenging texts, within approximately one year of the students' independent reading level. R2I is a hybrid of repeated readings [13] and the neurological impress method [14], both highly assistive methods for reading intervention. Read Two Impress has had large effects on students' reading fluency [15] reading comprehension [16] and independent reading level [17].

Young, Mohr, and Rasinski [15] claimed that the texts, however, were not frustrational, necessarily, but, rather, on the outer limits of the students' zone of proximal development [18] That is, adequate scaffolds were applied, and the students were able to engage in successful reading. Furthermore, texts were modeled and then practiced, essentially following the tenets of the gradual release of responsibility [19]. Thus, in this case, the higher-level texts did not impede their reading growth but, rather, enhanced it. Similarly, researchers have found challenging texts optimal when engaging in close reading protocols [10]. Read Two Impress has had similar success with challenging text since its inception and first use with a third-grade boy named, Emilio (pseudonym).

Emilio started something back in 2009, though his story was not told until 2012 by Mohr, Dixon, and Young. He was a struggling third grader who did not respond to multiple reading interventions and intense guided reading instruction in the classroom. He was approaching a place where students rarely catch their peers in reading—the rich were getting richer, and Emilio was getting poorer [20].

The reading specialist then did some research and presented a few potential interventions to the students. Emilio chose repeated readings [13]. After several weeks, his reading rate and comprehension had improved, and his stagnant reading level shifted positively for the first time in a long while. However, he still read in a monotone voice and appeared to not enjoy reading, despite his progress. Because of his improvement, the reading specialist was hesitant to remove repeated readings as an intervention, and so, it was decided to add neurological impress [14] to improve his reading prosody. The methods were combined and appeared to have a synergistic effect on Emilio's reading. By the end of the ten-week intervention, Emilio was reading at grade level with adequate reading fluency and comprehension.

In addition, Emilio showed an interest in reading and claimed his favorite author was Jeff Kinney. This was important because he had no favorite authors or books at the beginning of the intervention [21]. It seemed that he was motivated by his progress, which is why the current study added an additional component to the R2I protocol, reading aloud. While R2I has been used successfully with struggling readers, it seemed there were two missing pieces, including a complete modeling of the text and an opportunity for the student to read the text aloud as a whole.

The genesis of Read Like Me resulted from the promising results of R2I, and while the method improved reading fluency and comprehension, it failed to improve students' attitude [16]. It was decided that the method, while powerful, lacked authenticity. Students were not given the opportunity to read the text as a whole and feel the success of reading a challenging text from beginning to end. Therefore, the researchers added a few other elements, a concept often used with struggling readers typically referred to as "stacked instruction". This approach takes multiple research-based interventions and stacks them to work in a more synergistic and powerful way [21].

Thus, the researchers framed Read Like Me based on a whole-part-whole instructional process in the hopes of adding authenticity while simultaneously stacking instruction. In Read Like Me, the tutor reads the entire text aloud and entertains the student with a prosodic read aloud, then the tutor and student use R2I to assist the student in developing mastery of the text, and finally, the student reads the entire text aloud—in the end, the student engages in successful authentic reading.

## **2. The Benefits of Reading Aloud**

Reading aloud is one way to model how words printed on a page are converted into oral language with all of the variables of timing, phrasing, intonation, and emphasis (prosody) that speakers use. More simply, reading aloud models how the written word becomes the spoken word. The effects of good read alouds on literacy learning have been supported in the literature for many years [22–25].

These include fostering vocabulary growth [26,27], developing listening comprehension [28,29] and expanding an understanding of good sentence and story structure [30,31].

Beyond the cognitive benefits of read alouds (and perhaps more importantly) is the impact on affective factors. Choosing to read is determined by attitude and desire [32,33]. Reading aloud positively influences the attitudes of children toward reading and motivates them to want to read [23,34]. Hearing a story read in its entirety, being swept away by the words and the images they create, and experiencing the power of language to cause one to laugh or cry or wonder or hold your breath—all encourage youngsters to want more and, eventually, to be able to read it themselves. Having good models that bring text alive through the natural rhythm and beauty of language, encourages children to want to read just like that.

In *Read Like Me*, the interventionist begins the session with a powerful read aloud, allowing the child to hear the text in its entirety. Modeling the way language works to create vivid pictures of story, pulls the child into the text right from the start. As the text is revisited in smaller sections (using the impress method), the child is encouraged to use the same timing, phrasing, intonation, and emphasis. At the conclusion of the session, the child reads the whole book back.

As we know from years of research, perception of self as a reader, an affective factor, is an important determinate in reading success [35–37]. Using this intervention, *Read Like Me*, encourages children to see (and hear) themselves as good readers.

### **3. Significance of the Study**

Early literacy was considered a hot topic and deemed the most important in the 2018 *What's Hot What's Not* survey [38]. Reading research has been conducted for centuries, but yet, there is still a need for additional reading interventions, as no one intervention will work for every student. Thus, teachers need access to a plethora of options to support young readers who find the process difficult. This research aimed to describe a newly developed option for reading intervention and to track the growth of a second-grade student who has difficulty reading for a variety of reasons. The research was guided by the following research question: What are the effects of *Read Like Me* as a supplemental and a standalone intervention for a second-grade student who struggles with reading?

## **4. Method**

### *4.1. The Participant and the Interventionist*

The participant in the experiment was a second-grade student (8 years old) at the time the intervention took place. The student received services under Section 504 for attention-deficit/hyperactivity disorder (ADHD) and dyslexia. According to the American Psychiatric Association, ADHD is characterized by inattention, impulsivity, and hyperactivity—symptoms that arguably have a negative effect on one's ability to focus on reading. Dyslexia, defined in the American Disabilities Act, is a neurobiological disorder that results in an unexpected difficulty learning to read and write.

The student was nearly two years below grade level in reading prior to the intervention. He lacked confidence in reading but loved science. The participant was an active student and enjoyed discussion of any topic. It was important to serve this need during the experiment to maintain student focus during the intervention.

The interventionist for this experiment was a senior-level, undergraduate, pre-service teacher. The interventionist had training in the ethics of research prior to the conducted experiment. A lack of training undermines and potentially inhibits the success of both the intervention and the student's progress. The interventionist also had experience and training in components of the intervention including, but not limited to, tracking progress, collecting data, and selecting reading materials according to student needs. This provided the interventionist with background knowledge to ensure that accurate and appropriate measures were taken during the experiment. In addition, the

interventionist had previously administered Read Like Me to a second-grade student for 700 minutes prior to the study.

#### *4.2. Procedures*

The purpose of this study was to explore the effectiveness of a newly developed reading intervention for struggling elementary readers. The intervention, Read Like Me, is a multifaceted approach composed of several researched interventions. The researchers employed the timeless practice of reading aloud [39] at the beginning of the intervention, followed by a practice-based method called Read Two Impress [12]. After sufficient practice, the student then read the text aloud to the interventionist. In this study, the student received the intervention three times per week for 12 weeks. The following are the steps used in each thirty-minute session:

1. Choose a challenging text (approximately six months above the student's reading level);
2. Read the entire text aloud with appropriate expression while the student listens;
3. Go back to the beginning and read a page or paragraph aloud together;
4. Read slightly ahead of the student;
5. Read with good expression that matches the meaning of the text;
6. Have the student reread each page/paragraph aloud;
7. Continue with subsequent page/paragraphs until the text is complete;
8. Have the student read the book aloud as you did in the beginning (Read Like Me).

The intervention was given three days a week for 30 min each day and was conducted similarly during each session. To begin, the interventionist reads a book that is approximately six months above the student's current independent reading level. If the text appears to be too difficult after following the Read Like Me protocol, dropping a level may be necessary. Conversely, levels can be increased if the student reads with ease. In this particular case, the chosen books increased by one level each week. However, it remains a case-by-case decision. It is important for the interventionist to read the book with the exact expression and fluency with which they want the student to read.

After reading the book, the interventionist and student reread it together using the R2I protocol. The interventionist starts off and reads at a pace that is comfortable for the student but still challenges their normal pace. The goal is to push them to reach their full potential without overwhelming or frustrating them. Hence, the interventionist sets the pace with the particular student in mind. This phase is done page by page. Once the page is read together, the student then reads the page himself to the interventionist. This continues until the book is finished or the reading for that day is completed.

The third and final phase of the intervention is done solely by the student. The student starts from the beginning of the book and now reads aloud to the interventionist on his own. The interventionist assists as needed on major miscues but allows the student as much independence in this phase as possible. This is the phase that builds the student's confidence. The third phase completes the session for that day. It is important that the interventionist monitors the progress of the student throughout the treatment phase so that the levels of the books chosen are appropriate. This process continues for each session—three times a week for 30 min—for a minimum of 12 weeks. Following the twelve-week mark, data were reviewed and graphed to determine the results, and post assessments were administered to see if the progress remained or dissipated once the intervention ceased.

#### *4.3. Design and Instrumentation*

To complete the preliminary investigation, we planned a single-subject experimental ABCA design, meaning we established a baseline (A), introduced an intervention (B), modified the intervention (C), and returned to baseline (A). We used leveled reading passages to establish a baseline, monitor two treatment phases, and then returned to the baseline. For leveled passages, we used the Grade 2 Oral Reading Fluency passages from Dynamic Indicators of Basic Early Literacy Skills (DIBELS-ORF) [40].

The weekly administration of DIBELS-ORF provided a word recognition automaticity score (words read correctly per minute). During the oral reading, we also scored the student's reading prosody with the Multidimensional Fluency Scale (MDFS) [41]. Scores were independently reviewed to establish inter-rater reliability, and the resulting measure of agreement was considered outstanding ( $Kappa = 0.93, p < 0.001$ ).

In addition, the primary researcher administered the Gates MacGinitie Reading Test (4th Edition) for second grade (GMRT-4) before and after the intervention phases. The GMRT-4 is a standardized reading assessment that measures a student's reading comprehension, word knowledge, and decoding. Validity and reliability of the GMRT-4 is considered high. The correlations between the two forms (S for the pretest and T for the posttest) are strong on all three measures, including word decoding ( $r = 0.86$ ), word knowledge ( $r = 0.86$ ), and reading comprehension ( $r = 0.82$ ). The overall scores between the forms are also strongly correlated ( $r = 0.90$ ). Finally, the internal consistency and reliability is also considered high ( $KR-20 = 0.97$ ; [42]).

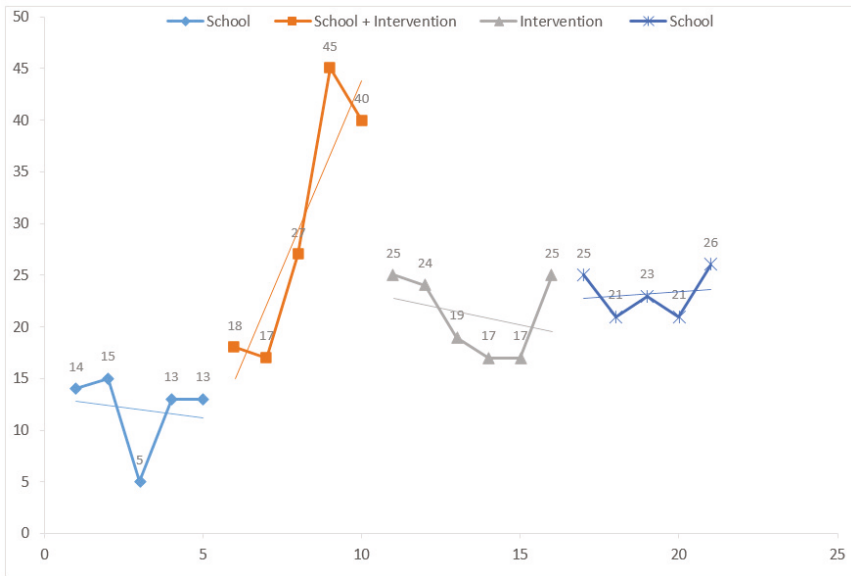
## **5. Results**

The entire study lasted for 21 weeks. The first five weeks was spent establishing a baseline using the DIBELS-ORF passages, and the student regularly attended school. The first treatment phase lasted six weeks and was comprised of regular schooling and after school Read Like Me tutoring. Neither DIBELS-ORF nor the MDFS was administered during the first week of tutoring, as the student was assessed at the end of the week prior by the primary researcher. The second treatment phase lasted six weeks and only included the Read Like Me tutoring because of the year-round school's summer break. Overall the student engaged in Read Like Me tutoring for approximately 1080 minutes. Once the child resumed regular schooling, the tutoring was removed, and the student was assessed once per week to reestablish a baseline. The student also took the GMRT-4 the week before (form S) and after (form T) the intervention phase.

### *5.1. Word Recognition Automaticity*

The initial baseline revealed, on average, that the student read around 12 words correctly per minute, and there appeared to be a slight downward trend (Figure 1). The student's baseline was not perfectly stable because of one slight anomaly (test 3) where the student performed below normal. However, the remaining four assessments were quite consistent (14, 15, 13, 13). With this in mind, the researchers agreed that an adequate baseline was established.

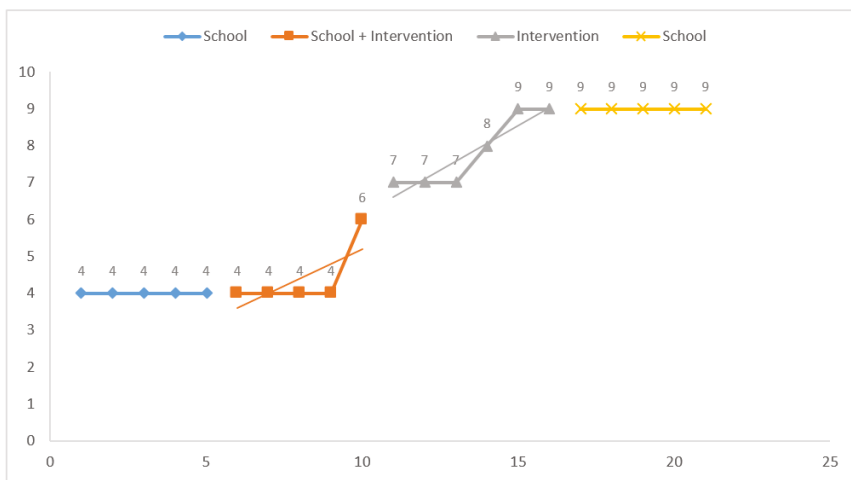
During the school + intervention phase, there was an apparent steep positive trend. At the onset, the student read between 17 and 18 words correctly per minute, but after a few weeks, the student's score was in the 40s. Conversely, during the intervention phase without regular schooling, the researchers observed a dip and another slight downward trend. However, on average, the student was still performing better (21 Words Read Correctly Per Minute; WCPM) than the baseline (12 WCPM). Finally, the baseline was reestablished and was considered relatively stable around 23 WCPM.



**Figure 1.** Weekly word recognition automaticity scores based on Dynamic Indicators of Basic Early Literacy Skills (DIBELS-ORF).

5.2. Reading Prosody

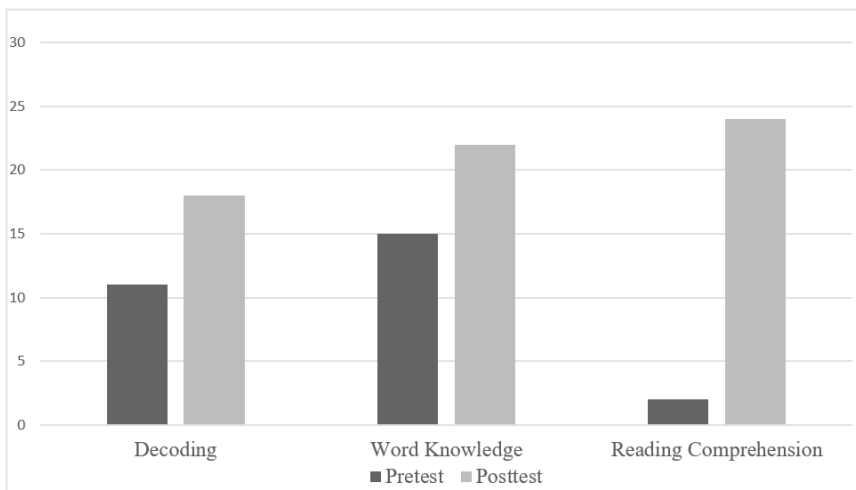
The initial baseline was stable, and the student was consistently rated a four using the MDFS rubric (Figure 2). During the school + intervention phase, the student was rated a four until the final week, when he was rated at a level six. As can be seen in the next intervention phase, the student continued to grow in reading prosody, achieving a rating of nine the final two weeks. When the intervention was removed and school resumed, the student remained a nine but showed no further growth in reading prosody.



**Figure 2.** Weekly prosody scores based on the Multidimensional Fluency Scale (MDFS).

### 5.3. Decoding, Word Knowledge, and Reading Comprehension

Due to the length of the GMRT-4, and the limited forms, the assessment was not used in a single-subject experimental manner. Instead, the GMRT-4 was administered as a pre- and posttest to obtain standardized scores in order to measure growth of the student's decoding skills, word knowledge, and reading comprehension. At the onset of the study, the student correctly answered 11 decoding questions, 15 questions in the word knowledge section, and only correctly answered two of the reading comprehension questions. Then, 12 weeks later, after receiving six weeks of school + intervention and intervention only, the student scored higher on all three measures, especially in reading comprehension where he scored 12 times better than before (Figure 3).



**Figure 3.** Pre- and posttest results from the Gates MacGinitie Reading Test (4th Edition) for second grade (GMRT-4).

## 6. Discussion

This study examined the effects of two intervention phases on a second-grade student's reading development, including word recognition automaticity (WCPM), reading prosody (expression), decoding skills, word knowledge, and reading comprehension. Overall, the researchers observed growth on all of the assessments. Thus, Read Like Me might serve other students who have difficulty with reading.

According to the results of the word recognition automaticity and prosody probes, the intervention worked best when paired with regular instruction. The intervention adheres to the gradual release of responsibility method [19], which may serve to increase the student's ability to quickly recognize words and read at an increased rate. The student first heard the story in its entirety and listened to the words read accurately. The second phase was an assisted reading approach that allowed students to practice alongside a proficient reader and then practice reading the words on their own, receiving feedback or assistance as necessary. In the end, the student has heard the words, read them with assistance, practiced the words, and essentially "performed" an oral reading of the text as a whole. In this case, multiple exposures to the words and the opportunity to learn and practice them served the student well.

It is important to note that continuation of the intervention over the break prevented the typical summer reading slide, where students often lose some of their reading gains [43]. This phenomenon is especially detrimental for struggling readers. It is also important to note that this student's reading growth was stagnant for much of his second-grade year; therefore, any amount of growth warranted



celebration. Albeit slow, Read Like Me successfully promoted, perhaps even kick-started, positive growth in reading rate and prosody.

Prosody has historically been neglected in reading instruction [44–46]. In a study [47] that employed reader theater and karaoke as reading activities, students in both the treatment and comparison groups made significant gains in word recognition automaticity, but only the treatment group made gains in reading prosody. The authors claim that this disparity was attributed to the types of instruction. Typical school instruction does, indeed, attend to reading rate but often neglects prosody. Because the interventions in the treatment (reader theater and karaoke) also focused on expressive reading, there was a much greater increase. Several components of Read Like Me focus on prosody. First, the initial read aloud provides a model of fluent and expressive reading [48]. Second, the added neurological impress component has been said to “etch” the interventionist’s prosodic renderings into the mind of the reader [14,49,50], and the immediate repeated reading allows the reader to demonstrate or mimic fluent and expressive reading. Finally, the student is asked to “read like me” and independently reads aloud the text similar to the initial oral reading done by the interventionist. Therefore, increases in reading prosody as a result of the intervention are likely.

When considering the results of the GMRT-4, the student made gains in all three areas tested. There was a 63% (7 points) increase on both the decoding and word knowledge portions of the assessment. In the comprehension section, the student scored 22 points higher, which was a 1100% increase. Clearly the time spent in class and on the intervention did more than help the student become a more fluent reader; it also helped him better understand text by increasing his decoding skills, word knowledge, and most importantly, reading comprehension—which is the main goal of reading.

Previous studies have confirmed that increasing foundational skills, such as decoding and word recognition automaticity, can lead to increased reading comprehension [51,52]. Research has also indicated that systematic instructional protocols can improve students’ reading ability, particularly those with ADHD [53] and dyslexia [54].

The increase in comprehension is also supported by the theoretical framework of this study, indicating that the student’s increased automatic reading freed cognitive resources that could then be allocated to reading comprehension [1]. When considering other theories, admittedly there was less of an emphasis on the transactional nature of reading experiences [55] and more of an emphasis on a previous theoretical understanding of reading, namely the New Criticism literacy theory [56]. The theory promotes intense close readings and focuses on text-dependent comprehension rather than a focus on prior experiences of readers—a strategy that has dominated reading instruction for decades [10]. While Read Like Me did not have an explicit reading comprehension component, the repetitive nature likely helped the reader understand the literal meanings of text. Moreover, the GMRT-4 comprehension section arguably tests student’s ability to understand text more explicitly than implicitly. Thus, the type of instruction used in the intervention closely matched the assessment employed.

## **7. Limitations and Further Research**

Standardized tests are not without limitations, as they are snapshots taken on a single day, and they are not indicative of the precise potential of a student. However, the researchers felt that standardized tests would complement the progress monitoring measures administered throughout the study, as they added specific measures of decoding, word knowledge, and reading comprehension, which were not directly measured during the course of the intervention. Additional research should likely include some form of reading comprehension monitoring throughout the study.

There are inherent limitations in single-case experimental research, most notably the inability to generalize beyond the case. In this case, a second grader diagnosed with ADHD and dyslexia benefited from the intervention. There is no guarantee that Read Like Me will work with every student who struggles with reading, but it does serve as an additional option for teachers and interventionists. A larger experimental or quasi-experimental study with treatment and control groups could further examine the utility and effectiveness of the intervention.

## 8. Conclusions

Overall, supplementing regular instruction with Read Like Me successfully accelerated the reading development of the second grader involved in the study. The stacked approach increased the student's word recognition automaticity, reading prosody, decoding skills, word knowledge, and reading comprehension. Although this study cannot be generalized, the results suggest that this may be a viable option for teachers or interventionists working with students who find reading difficult.

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Article

# Effects of Fluency Oriented Instruction on Motivation for Reading of Struggling Readers

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**Abstract:** This paper looks at the effects of an intervention, based on fluency oriented reading instruction (FORI), on the motivation for reading among struggling readers in First Class in Irish primary schools. The intervention took place in learning support settings in three primary schools located in urban educationally disadvantaged communities in North Dublin. The study was conducted through a pragmatic lens with research questions framed to shed light on the motivation for reading of students in First Class from disadvantaged backgrounds. A mixed methods design with a concurrent triangulation strategy was employed, facilitating the exploration of multiple research questions using questionnaires and semi-structured interviews with teachers and parents and conversational interviews and surveys with students. The perspective of reading motivation guiding the study recognised the overlapping influences of teachers, parents and the student himself or herself. Findings, as reported by these research informants, indicate that the FORI intervention had a positive impact on the motivation for reading of struggling readers in First Class. In particular, the intervention was found to decrease students' perceived difficulty with reading and increase their reading self-efficacy and orientation towards reading.

**Keywords:** struggling readers; oral reading fluency; reading motivation; learning support; socioeconomic status

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## 1. Introduction

In today's society, it is critical that every child has the fullest opportunity to become an accomplished reader. Instructional strategies in reading are continually debated as the quality of an individual's life is affected by their literacy competence, which in turn is essential for an individual's personal and social fulfilment. The consequences of not learning to read proficiently are enormous, with those failing in this regard facing personal, social and economic limitations [1]. Internationally, there has been considerable interest in identifying ways in which to improve literacy standards and so avert the aforementioned consequences. In Ireland, despite the level of interest focused on improving literacy standards and the magnitude of policies in this regard, many students, particularly those from lower socioeconomic backgrounds, continue to have difficulty achieving success in reading [2].

### 1.1. Background

The most common approach to assist children who present with reading difficulties in Irish primary schools is to withdraw them from the regular classroom and provide learning support tuition either individually or in smaller groups [3,4]. Research on the nature of reading instruction provided in these withdrawal settings indicates an emphasis on cognitive and metacognitive processes with less attention paid to motivational instruction and the role played by affective factors [5–7]. However, the affective aspects of reading have been shown to contribute unique variance to reading achievement, and differences in reading attitude and motivation have been implicated in the socioeconomic gaps in reading achievement found consistently worldwide [8–11]. Young students, who have difficulties

in learning to read, need to be particularly motivated in order to engage in a process where they have already experienced failure [7]. The extent to which they are motivated by their *early* reading instruction, therefore, has a significant impact on the likelihood of them succeeding in reading, which in turn can impact on their school experiences in later years [12]. Consequently, finding ways to motivate young children to read is identified as a priority in reading research [13].

This paper presents the results of research carried out on the effects of fluency oriented reading instruction (FORI) on the motivation for reading among struggling readers from areas of low socioeconomic status. Research in the area of motivation has an extensive history and has long been regarded as having a key role in reading achievement [14]. Hence, a better understanding of the relationship between fluency oriented reading instruction and motivation to read has practical and theoretical implications. If this particular type of reading instruction is found to significantly impact on motivation to read, this would indicate a need to focus more on improving oral reading fluency skills. Conversely if motivation to read has a subsequent and sustainable effect on reading skill development, this would indicate a need to integrate more techniques into early reading instruction that are focused on improving student motivation to read as well as techniques that specific reading skills.

### *1.2. Description of Study*

The study, which was conducted in three disadvantaged primary schools in the Dublin Northside Partnership catchment area, examined the effects of an on-site reading intervention on the motivation for reading of struggling readers. The intervention, which was based on fluency oriented reading instruction, took place in learning support classrooms in these schools. The research focused on students in First Class who were receiving learning support for reading and were identified as having poor motivation for reading. The study is specifically focused on students in First Class as research has shown this to be a critical period of rapid skill development that can take readers from word-by-word reading to fluent speech-like reading by the end of that grade [15,16].

### *1.3. Rationale for Fluency Oriented Reading Instruction*

Helping students become fluent readers is a central goal of early reading instruction [17–19]. Students who do not develop reading fluency by the middle grades of primary school normally struggle with reading throughout their lives [20,21]. While numerous reading theories and a wide range of research have focused on explaining how children learn to read [20,22,23], there is still much debate amongst reading researchers, parents and teachers over which types of early reading instruction are most effective [24–26]. In addition to early reading instruction that focuses on phonics, word decoding skills, vocabulary development, and comprehension, reading instruction that builds a child's oral reading fluency is now considered by some reading researchers to be a vital but often neglected element of a balanced reading programme [18,20,21,27].

Fluency oriented instruction was selected based on research indicating that reading fluency is an important factor when considering a reading intervention for students experiencing difficulties with reading in the early years of primary school [28]. Oral reading fluency is seen as fundamental to the holistic development of reading skills as children move from word-by-word to fluent, expressive reading [29–31]. It has been identified as a particularly salient factor when considering the achievement, or lack of achievement, for young struggling readers who have a greater deficit in reading fluency than in word recognition or comprehension [30,31]. Other research suggests that word recognition and reading fluency difficulties may be the key concern for upwards of 90% of children with significant problems in reading comprehension [32].

### *1.4. Fluency Oriented Instruction and Struggling Readers*

Fluency in any activity is achieved largely through practice and repetition—the musician rehearses, the athlete engages in training drills, the actor spends time rehearsing pieces that will eventually be performed on stage, and the child learning to ride a bike spends hours repeating the same basic

skills in a quest for competence. The practice referred to in these contexts involves the repetition of a particular tune, skill, movement, or composition many times. Similarly, fluency is achieved in reading through repeated practice of selected texts. While skilled and competent readers who have mastered decoding (word recognition) are often able to achieve and maintain fluency in reading through wide and independent reading, for poor readers, repeated reading of the same text is an essential method for achieving fluency [18,33]. Research on repeated reading as an instructional strategy indicates that when students orally practiced a piece of text they improved on their rate, accuracy and reading comprehension of that text [34]. Such an accomplishment is to be expected given the same text is revisited many times. However, it is also found that when students moved to new passages, their initial readings of those new pieces are read with higher levels of fluency and comprehension than the initial readings of the previous passage, even though the new passage was as difficult as or more challenging than the previous piece [33].

### *1.5. Motivation and Reading*

Traditionally, research carried out on motivation as it pertained to education focused mainly on the concept of achievement or academic motivation as a broad construct generalized across all domains in a child's academic experience. Only in the relatively recent past has research focused on the intersection of motivation and reading achievement [7,35]. Researchers and educators who have conducted investigations specifically in the field of motivation for reading have found the concept to be multifaceted with a recognition of the affective domain as a critical element in reading instruction [36,37]. Once the affective aspects of reading were recognised as important in skill development [36], a variety of constructs were posited by theorists to explain reading motivation and how it influences students' reading engagement [38,39].

Since the ultimate goal of literacy instruction is 'the development of readers who can read and who choose to read' [40] (p. 19), it is now generally accepted by teachers of young children that reading motivation plays a critical role in reading development [41,42]. Research on motivation has thus provided compelling evidence that success in reading demands the integration of cognitive, language and motivational engagement [37]. Recently, there has been a growing interest in the impact of motivation in the early years, leading researchers to focus specifically on the motivation of readers in the lower grades [43–45]. Researchers in this area argue that it is still unclear how broad the construct of reading motivation needs to be to capture the early development of reading skills [46]. What is clear is that there are a variety of possible reading motivations that can influence children's engagement in reading and their reading performance [47,48].

### *1.6. Importance of Motivation for Struggling Readers*

Research has indicated that up to ten percent of the variance in reading performance measures of students in the higher primary class levels is attributed to reading motivation [49]. If individuals believe they can be successful at an activity they strive to master that task. As students become more motivated to engage in the reading process, they are subsequently more likely to be successful [50]. Therefore, students who experience instruction that increases their motivation for reading at an early stage in their schooling are more likely to have a positive academic self-concept. Conversely, a lack of student engagement with literacy is identified in the literature as a fundamental obstacle to achievement in our schools [51] with the likelihood that struggling readers become poorly motivated to read if they repeatedly experience failure in acquiring even the basic reading skills [52,53].

Some researchers have proposed that poor motivation may be a defining feature of reading failure [54,55]. Children at risk for reading failure are likely to hold more negative self-concepts [53,56,57], display less emotional self-regulation [58], and avoid reading activities [59,60]. Morgan and Fuchs [41] in reviewing the research on reading motivation presented a number of studies that point towards a bidirectional relationship between motivation to read and reading skill development. Students tend to read competently and more frequently and without fear of failure when they are motivated to engage



in the process [47]. Conversely, children who struggle with reading frequently become de-motivated, read less and become even weaker readers as they progress through the grades [61]. For this reason, motivation can be a compensatory factor, potentially mediating other discrepancies of struggling readers by creating a cycle of increased competence, increased motivation, and increased reading amount [62].

**2. Methodology**

This study draws on the theoretical perspective of multiple goals in motivation [63]. In particular, the research is grounded in the work of Eccles on expectancy–value theory of motivation [64]. Consistent with expectancy–value perspectives, the study focuses on the research of Guthrie, Coddington and Wigfield [65], who suggest *reading orientation* and *perceived reading difficulty* as fundamental constructs in examining reading motivation and on the work of Wigfield et al. [49], who emphasised the role of *self-efficacy* in reading as a critical construct of motivation. Accordingly, these three constructs of motivation (self-efficacy, reading orientation, and perceived reading difficulty) were selected for this study based on their potential for influencing the development of reading skill in the early primary school years. In this study reading orientation relates predominantly to students’ interest in reading and their attitude toward reading.

The study was conducted through a pragmatic lens, with research questions framed to shed light on the motivation for reading of students in First Class from disadvantaged backgrounds. A mixed methods concurrent triangulation strategy was adopted to gather data from teachers (both class teachers and learning support teachers), students and their parents. In this triangulation approach both quantitative and qualitative data were collected concurrently providing cross-validation and an opportunity to determine whether there was convergence, differences or a combination of both in the data. A summary of the data sources including questionnaires and semi-structured interviews with teachers and parents and conversational interviews and surveys with students is presented in Table 1.

**Table 1.** Data sources for assessing motivation for reading.

Research Question	Motivation Constructs Assessed	Data Source					
		Teachers’ Voice [Learning Support and Class Teachers]		Students’ Voice School A, B and C (n = 15)		Parents’ Voice	Researcher
		QUAN	QUAL	QUAN	QUAL	QUAL	QUAL
Effects of FORI on the motivation for reading of students in First Class	Self-efficacy	Perceptions of student efficacy for reading [5 items]	Individual semi-structured interviews Reflective journal	Student efficacy for reading [6 items]	Individual interviews (conducted with survey)	Individual and semi-structured focus group interviews	
	Reading orientation	Perceptions of student reading orientation [9 items]	Individual semi-structured interviews Reflective journal	Student reading orientation [10 items]	Individual interviews (conducted with survey)	Individual and semi-structured focus group interviews	Field notes
	Perceived difficulty in reading	Perceptions of student difficulty in reading [6 items]	Individual semi-structured interviews Reflective journal	Student perception of difficulty in reading [6 items]	Individual interviews (conducted with survey)	Individual and semi-structured focus group interviews	

**2.1. Research Questions**

The research carried out in the course of the intervention examined the effects of fluency oriented reading instruction (FORI) on three reading motivation constructs: reading self-efficacy, reading orientation, and perceived difficulty with reading. In particular, the study sought to investigate the following research questions:

- What are the effects of FORI on the reading self-efficacy of struggling readers?
- What are the effects of FORI on the reading orientation of struggling readers?
- What are the effects FORI on the perceived difficulty with reading of struggling readers?

## 2.2. The Research Subjects and Participants

The research subjects for the intervention were fifteen students in First Class who were struggling readers and were identified as being poorly motivated for reading. All students (eight boys and seven girls) were between the ages of six years one month and seven years two months at the beginning of the study with a mean age of six years, ten months. The student cohort, located across three research sites, represented seven different nationalities and included one child from the travelling community. (The Travelling community is an Irish ethnic minority group whose members maintain a set of traditions language, culture and customs. The distinctive Traveller identity and culture, based on a nomadic tradition, sets Travellers apart from the sedentary population or ‘settled people’ of Ireland.) The other research participants for the intervention were three learning support teachers, five grade teachers (First Class) and the parents of the participating students.

## 2.3. Data Collection

The motivation for reading of struggling readers was assessed before and after the reading intervention using the Young Reader Motivation Questionnaire—Student Form (S—YRMQ). The items on this questionnaire were derived from two standard questionnaires—the *Young Reader Motivation Questionnaire* [43] and the *Me and My Reading Survey* [66]—and were adapted to the aims of the study. This survey was chosen over more commonly used instruments such as Wigfield, Guthrie, and McGough’s [67] Motivation for Reading Questionnaire because it was designed to be used with younger children. The S—YRMQ was composed of three subscales to represent the three motivational constructs to be assessed. The *Efficacy for Reading* subscale of the S—YRMQ included six items, e.g., “Do you think you read well?” and “Are you good at remembering words you have seen before?” The *Reading Orientation* subscale of the S—YRMQ included ten items, e.g., “Is it fun for you when you read books?” and “Do you like to read during your free time or do something else?” while the *Perceptions of Difficulty* subscale of the S—YRMQ included six items, e.g., “Are the books you read in class too hard?” and “Do you need to get some extra help in reading?” The S—YRMQ was administered to each child individually at the beginning of the intervention and again at the completion of their series of lessons.

Student’s motivation for reading was also assessed using the teacher form of the Young Reader Motivation to Read—Teacher Rating (T-YRMR). This form was designed to parallel the student rating form with questions worded to reflect teachers’ perceptions of their students’ motivation for reading. Class teachers and learning support teachers completed this questionnaire. The T-YRMR featured 20 items spread across three subscales: *Perceptions of Student Self-Efficacy for Reading*, *Perceptions of Student Reading Orientation*, and *Perceptions of Student Difficulty in Reading*. All items were worded in declarative format, e.g., “This student thinks he/she is good at remembering words”; “This student thinks it is fun to read books”. Teachers responded to each item on a 4-point scale (1 = *No, Never*; 2 = *No, Not Usually*; 3 = *Yes, Sometimes*; 4 = *Yes, Always*). Two additional Likert-style questions were included in the questionnaire to gauge teachers’ overall view of each child’s achievement level in reading for their age and their overall level of motivation for reading.

Qualitative measures were used to triangulate the evidence from these survey instruments by conducting semi-structured interviews with the teachers and conversational interviews with the students. These conversational interviews were also conducted with the students six months after the intervention to explore enduring effects of the intervention. Individual semi-structured interviews and focus group interviews were also held with parents to triangulate data on student’s motivation for reading. These interviews took place before and after the intervention and again six months later.

The concurrent gathering of information throughout this phase provided cross-validation and multiple opportunities to determine whether there was convergence in the data. An elucidation of the triangulation of data to ascertain motivation for reading is presented in Figure 1 where details of the research carried out is illustrated. Bi-directional dotted arrows indicate where comparison of data was used between students and parents and between classroom teachers and learning support teachers to triangulate assessment of student’s motivation for reading both pre and post intervention.

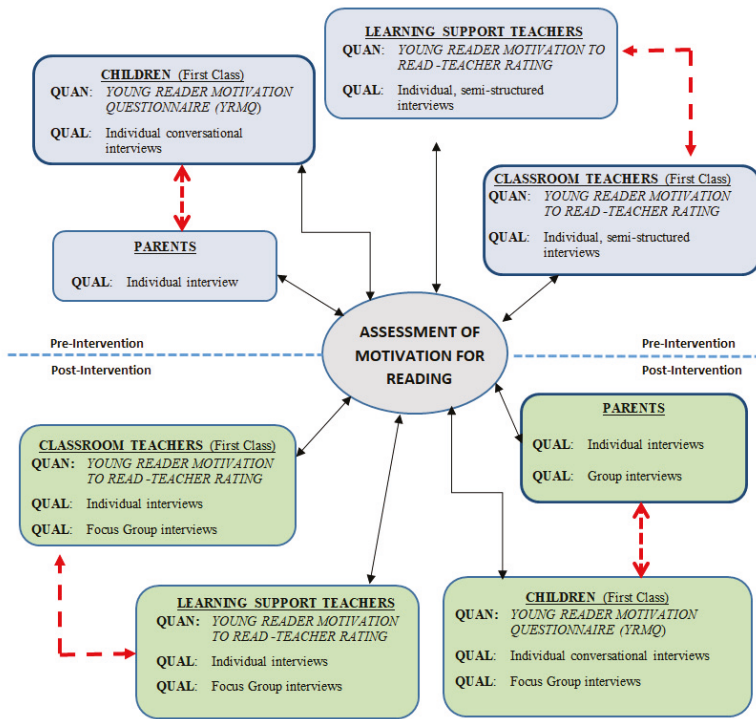


Figure 1. Assessment of motivation for reading (concurrent triangulation design).

Teacher Questionnaire Validity

As the same questionnaire was completed independently for each student by learning support teachers and class teachers, a valuable validity check on the instrument was possible. Initial inspection of the scores reveals that learning support teachers and class teachers reported very similar ratings for individual students on the reading efficacy and reading orientation subscales. Closer statistical analysis carried out on the ratings reveal a close clustering of scores along the linear trendline, indicating positive correlation coefficients ( $r = 0.79$ ;  $r = 0.85$ ) between responses (see Figures 2 and 3).

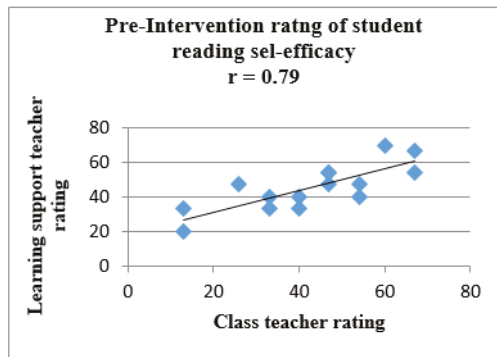


Figure 2. Correlation between teacher ratings of student reading self-efficacy.

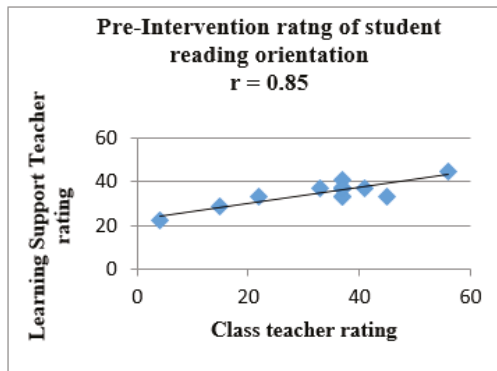


Figure 3. Correlation between teacher ratings of student reading orientation.

2.4. The Reading Intervention

The intervention, based on fluency oriented reading instruction (FORI), took place over an eight-week period in three schools. Each day, learning support teachers in these schools instructed struggling readers who were withdrawn from their base class and were taught in groups of five in a learning support room. The fluency oriented reading instruction used in the study was an adaptation of an approach to reading instruction developed by Stahl and Hueblich [68]. It was designed to increase the oral reading fluency of the students over the course of the intervention with the hypothesis that this type of instruction would also have a positive influence on their motivation for reading. The intervention featured the gradual release of support from a more knowledgeable reader (in this case the learning support teacher) towards independent reading by the students over the course of a unit of instruction (see Figure 4).

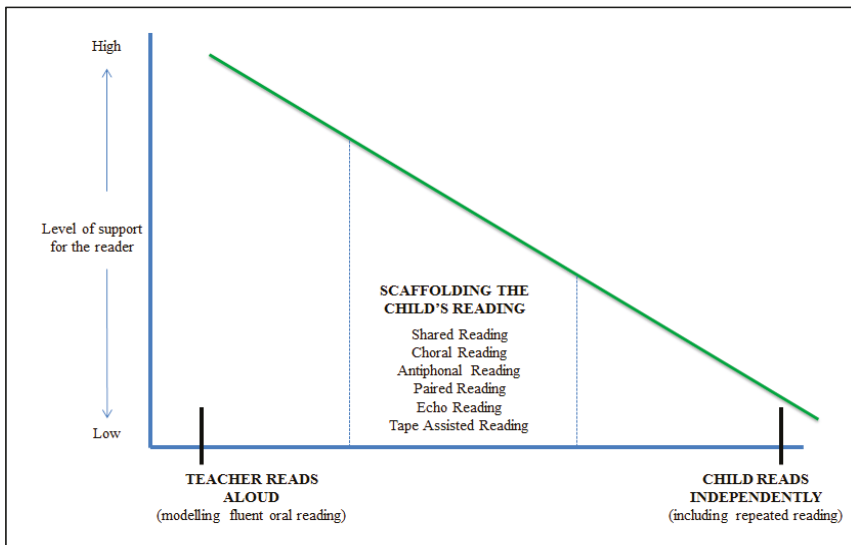


Figure 4. Gradual release of responsibility: from modelling to independent reading.

At the beginning of each unit, the learning support teacher carried out full responsibility for modelling a fluent rendering of the text, with a view that the students would be able to read the same

text independently by the end of the unit. The programme was agreed by the participating teachers and featured consistent elements such as modelling fluent reading, assisted guided oral reading instruction (e.g., echo reading, choral reading, antiphonal reading, and paired reading), partner reading and home reading. Word study and syntax activities were also integral elements of the intervention to ensure students had opportunities to build up their sight word knowledge in order to recognise words quickly.

Research on reading instruction indicates that students need plenty of opportunities to read significant amounts of connected text to learn to read fluently [68–70]. Hence, a feature of the intervention was the repeated reading and timed repeated reading of the same text to improve students' automatic word recognition along with their use of appropriate expression. To ensure that students were not bored or fatigued by using the same text, a wide variety of fluency related activities were designed based on all texts. At the beginning of each unit the learning support teachers were furnished with multiple copies of the selected core text and a set of resources for each planned activity in the unit.

The intervention was divided into four units of instruction, with each one focused on fluency-related activities built around a single text. Each unit was taught over two consecutive weeks using a pre-determined fluency oriented reading instruction programme for each week (see Table 2). The first lesson of each unit commenced with the teachers presenting the text with a variety of pre-reading activities that introduced the characters and the seminal vocabulary of the narrative. The teachers read aloud from the appropriate text while the students followed along using their text. On the second day of the unit of instruction, the teachers asked the students to echo read the text.

On the third day of the unit, teachers asked their students to perform a choral reading of the passage. The students were engaged in partner reading of the text on day four of the unit. The fifth day of instruction each week involved performance-related activities designed to motivate pupils to continue to participate in the intervention and to engage students in activities such as timed repeated reading and cumulative choral reading.

A constant feature of the intervention was the requirement that students read passages from the core text at home each day and have a parent or guardian sign a home reading log. This was an important element of the intervention as it ensured that parents were kept informed of progress and remained involved in the process. In the second week of the instructional unit, the emphasis was on increasing students' motivation to read by engaging in a variety of reading activities that encouraged the students to read with increased decoding speed and accuracy. Teachers recorded the use of these core fluency oriented activities (e.g., word dash, timed repeated reading, phrase reading) in an instructional log. The motivational aspect of the intervention was increased by the students recording their progress in these reading activities over the week in their FORI journals. Prosodic elements of fluent reading were also addressed in the second week of each unit when students were introduced to play scripts incorporating vocabulary from the core narratives. Students re-read these scripts in order to prepare for a Readers Theatre performance on the final day of each unit. This strategy, which combined reading practice and performing, enhanced students' reading skills and confidence by having them practice reading with a purpose.

Table 2. Sample weekly plan for fluency oriented reading instruction (week one of a single unit).

	Monday	Tuesday	Wednesday	Thursday	Friday
<b>School Activity</b> [based on selected text]	<p><b>Before Reading</b> Teacher introduces the text (background knowledge, vocabulary, title, pictures, characters, plot)</p> <p><b>Modelled Reading</b> Teacher reads text or selection of text aloud; students listen</p> <p>Teacher repeats reading of text and students follow along with their own copy</p> <p><b>Responding to Text</b> Discussion takes place as selection is read to develop text comprehension. Use of graphic organizers (e.g., diagrammatic innovation, story map) Matching Activity: Characters to names, e.g., memory game</p>	<p><b>Before Reading</b> Retelling the story (<i>wordless books</i>) to be used here as visual cue to retelling); recall of key characters and names; character map (diagram)</p> <p><b>Audio-Assisted Reading</b> Students read along with an audio version of the text. Students practice until they can read the story <i>fluently</i> and accurately</p> <p><b>Echo Reading</b> Teacher reads one or two sentences . . . up to a paragraph, and students echo that reading</p> <p><b>Responding to Text</b> Comprehension developed through various strategies such as student questioning, visualisation, etc.</p>	<p><b>Before Reading</b> Phrasing: Slide and Glide (Teacher reads text stopping and allowing students to complete phrase)</p> <p><b>Choral Reading</b> (a) Students choral read same text (b) Cumulative choral reading</p> <p><b>Repeated Choral Reading</b> Students are introduced to the concept of reading for the duration of the one-minute timer while choral reading</p> <p><b>Responding to Text</b> Sentence Reconfiguration <b>Phrasing:</b> Matching phrases (sentence completion); using phrase strips</p>	<p><b>Before Reading</b> Phrase grid activity. Dice game where students finish phrase based on the text corresponding to the number that they throw</p> <p><b>Partner Reading</b> Paired Repeated Reading Same text (partners selected by teacher to ensure mixed ability) Whisperphones used to facilitate multiple synchronous paired reading</p> <p><b>Individual Whisper Reading</b> Toobaloo used here to facilitate immediate feedback to students as they hear themselves read through the device</p> <p><b>Responding to Text</b> Write and draw activity based on individual words identified by teacher</p>	<p><b>Timed Repeated Reading</b> Students are introduced to the concept of reading for the duration of the one-minute timer and recording the WCPM on their graphs. Words provided (and noted) to child after 3 secs if unknown. NOTE: Individual sight word lists can be introduced as a Timed Reading Activity in week 2</p> <p><b>Word Study</b> on 'tricky' words Students complete activities in individual scrap books, e.g., story map, sentence reconfiguration, phrase completion</p> <p><b>Performance Element</b> Performance of text and of selected FORI activities, e.g., cumulative choral reading.</p>
<b>Motivational Aspect</b>	Introduction to timed reading (character card sheets used for timed reading, e.g., how many characters can you read in a minute)	Sight Word Activity: sight word hunt using wooden templates. Students record the sentence/phrase on their wipe boards	Super Stamps introduced for completion of activities. Stamps recorded in bar graph configuration to depict progress	Motivational resources to be used at teacher's discretion to encourage performance	Record progress in Timed Repeated Reading on graph STAR recording template Scooby Doo Reading Medals
<b>Resources</b>	Texts One-minute timer	Texts Wordless books Wipe boards Home reading log	One-minute timer; Super Stamps Slide and Glide sheets Wipe off phrase strips Home reading log	Whisperphones; Toobaloo Phrase Grids Stickers, stars, cards, smiley erasers; Home reading log	FORI Scrap Books Timed Repeated Reading Graph Home reading log
<b>Home Activity</b>	Students take book home and read to parent/guardian. Home reading log is signed and number of pages recorded	Students take book home and read to parent/guardian. Home reading log is signed and number of pages recorded	Students take book home and read to parent/guardian. Home reading log is signed and number of pages recorded	Students take book home and read to parent/guardian. Home reading log is signed and number of pages recorded	Students take book home and read to parent/guardian. Home reading log is signed and number of pages recorded

## Intervention Fidelity

Learning support teachers were trained in all of the FORI lessons before administering them. Additionally, all lessons were written out as scripts to help ensure the planned lessons were adhered to and that there was uniformity of instruction across teachers and groups. To determine the fidelity of the lessons, a minimum of three instructional sessions were observed each week. For each lesson, teachers were expected to include a minimum of two core FORI activities. Similarly, for the sessions involving a performance lesson, the teachers were to afford each student the opportunity to perform independently on a previously rehearsed fluency oriented task. Finally, students were inevitably absent for an occasional instructional day due to illness, for example, or their class being involved in another activity. When students missed a lesson, catch-up sessions were held to instruct them on the content of the lesson, either in a group or individually. Across all sites and over the period of the intervention, a total of four students required such catch-up sessions. Thus, all students received instruction on all FORI lessons.

### *2.5. Teacher Professional Development*

Prior to the intervention, the learning support teachers in this study participated in approximately fifteen hours professional development on fluency oriented reading instruction and aspects of reading intervention design. During the seminars, teachers were familiarised with the instructional models to be employed and were given sample lesson plans for the implementation of the proposed intervention. Seminars included videotapes that introduced oral reading fluency instructional strategies and that modelled the proper execution of fluency oriented instruction. Discussions were facilitated with the teachers regarding the integration of the proposed instructional approach into their own individual learning support programmes. During these seminars the teachers were encouraged to talk about what was going on in their respective classrooms and to work through any concerns and questions they had with implementing the proposed fluency oriented reading instruction. Materials for this instruction were identified (and in some cases designed) as part of the professional preparation for the intervention. In the course of these seminars, four levelled reading texts were identified and chosen as the focus for the intervention. These texts had reading levels that correlated closely to other books already in use in the three schools. The texts, though short, were interesting enough to warrant discussion and vocabulary instruction on individual words and were selected based on their suitability for the type of reading instruction planned. They had carefully controlled language, repetitive patterns and repeated vocabulary and were suitable for fluency oriented reading instruction and for repeated reading in particular.

### *2.6. Scoring the Motivation for Reading Questionnaires*

For analysis purposes, and to triangulate the findings from the surveys with qualitative data, an overall reading motivation percentage score for each construct was derived from both the student questionnaires and the teacher questionnaires before and after the intervention.

#### *2.6.1. Scoring the Student Survey (S—YRMQ)*

The Student Survey (S—YRMQ) comprised twenty-two multiple choice items with the set of potential answers for individual survey questions ranging from two to four possible responses. In order to quantify the level of motivation for each item, a percentage score was assigned to the nature of a response dependent on the number of answers to individual questions that were offered to students. For example, in the case of the sections assessing reading self-efficacy and reading orientation, zero percent (0%) was assigned to the most negative response with one hundred percent (100%) representing the optimum positive answer. Items in the third section that assessed students' perceived reading difficulty were phrased in such a manner that if a student answered 'yes' or 'always,' it represented a

high level of difficulty and percentages were assigned accordingly. Examples of percentages assigned to individual responses across the range of multiple choice questions can be seen in Figure 5.

<b>Q 1</b> (iii)	<b>Do you think you read well?</b>			
	1	2		
	No [0%]	Yes [100%]		
<b>Q 2</b> (v)	<b>How would you feel if someone gave you a book for a present?</b>			
	1	2	3	
	Disappointed [0%]	Sort of happy [50%]	Happy [100%]	
<b>Q 3</b> (vi)	<b>Learning to read is</b>			
	1	2	3	4
	Really easy [0%]	Sort of easy [33%]	Sort of hard [67%]	Really hard [100%]

Figure 5. Coding for motivation for reading survey (student form).

For analysis purposes, and to triangulate the findings from the surveys with qualitative data, an overall reading motivation percentage score for each construct was derived. This was achieved by scoring the individual student response on each item and then calculating the average percentage score for all students in each construct. The pre-intervention motivation scores for the students in one research site (School A) across all three constructs are presented in Table 3 as an example. The percentages included in this table represent the student self-rating responses only, with the reading efficacy percentage score for one student (SB4) highlighted for illustrative purposes. The figure of 22 percent for this student represents an average score for this construct derived from responses to the six items featured in the section on reading efficacy.

Table 3. Example of student self-rating scores (pre-intervention).

	<b>Motivation for Reading (School A)</b>		
	<b>Student Self-Rating %</b>		
	Reading Efficacy %	Reading Orientation %	Perceived Difficulty in Reading %
<b>SB1</b>	62	30	72
<b>SB2</b>	47	70	70
<b>SB3</b>	72	50	53
<b>SB4</b>	22	55	75
<b>SB5</b>	58	40	61

The responses of this student (SB4) to questions on efficacy for reading, administered before the intervention, are presented in Figure 6 along with earned percentage scores.



1. EFFICACY FOR READING				% Score
	Can you work out really hard words by yourself when you read?			
(i)	1 No, never [0%]	2 Sometimes [50%]	3 Yes, always [100%]	0
	Are you good at remembering words you have seen before?			
(ii)	1 No, never [0%]	2 Sometimes [50%]	3 Yes, always [100%]	50
	Do you think you read well?			
(iii)	1 Yes [100%]	2 No [0%]		0
	Can you work out really hard words in a story even if there are no pictures?			
(iv)	1 No, never [0%]	2 Sometimes [50%]	3 Yes, always [100%]	0
	How do you feel when you read out loud to someone?			
(v)	1 Happy [100%]	2 Embarrassed [67%]	3 OK [33%]	33
	What kind of reader are you?			
(vi)	1 I'm a very good reader [100%]	2 I'm an OK reader [50%]	3 I'm NOT a very good reader [0%]	50
<b>Mean Self Efficacy % for student (SB4)</b>				133/6 = 22%

Figure 6. Example of scoring of quantitative measures (Student SB4: reading efficacy).

### 2.6.2. Scoring the Teacher Survey (T-YRMR)

The Teacher Survey (T-YRMR) comprised 20 statements organised in three sections reflecting the constructs of reading motivation assessed in the study. Teachers were asked to rate the likelihood of a particular behaviour occurring and were given a selection of four potential answers: (i) *No, never*, (ii) *No, not usually*, (iii) *Yes, sometimes*, or (iv) *Yes, always*. The optimum positive response (*Yes, always*) was assigned 100%, with scaled scores down to 0% for the most negative response. In instances where the statements were phrased in the negative form, e.g., ‘the student avoids participation in reading activities’, 100% was assigned to the “No, never” response with the scoring scaled down to 0% for the “Yes, always” response.

### 2.6.3. Data Analysis for Interviews

The transcripts for interviews with teachers and parents and for conversational interviews with students for this phase of the study were coded in order to identify the source of the data and to ensure quotes could be traced back to the original transcript. In coding all these variables, for convenience, the letters A, B and C were assigned to the three schools to identify the three different sites. For example, using this method, data from the learning support teacher in School A was coded as LSA1, data from a particular student in School B received the coding SB1, SB2 and data from a parent focus group in School C was coded as PFGC. Interviews were categorised according to four major themes reflecting the research questions for this phase of the study and were also assigned a descriptive code. For example, quotes referring to the motivational constructs of self-efficacy, reading orientation and perceived difficulty with reading were assigned SE, RO and PRD, respectively. After each piece of data had been assigned a code, a further layer of analysis was conducted to extract and deduce the meaning of each one. Each quote that warranted inclusion was then numbered within the category for reference purposes.

### 3. Results

The impact of FORI on the motivation for reading were analysed in the context of a chorus of research voices representing teachers, parents and students. One major conclusion drawn from the study is that FORI, involving a gradual release of responsibility from the teacher to the student, impacts positively on the motivation for reading of struggling readers. This is based on a comprehensive set of data generated by teachers, parents and students on the assessment of reading self-efficacy, reading orientation and perceived reading difficulty before and after the intervention. The quantitative results of both teacher and student surveys of reading motivation are reported here in summative form. Qualitative data from the interviews conducted with all research informants support these findings and are included in the discussion section of this paper.

#### 3.1. Reading Self-Efficacy of Students

The data from post-intervention surveys and interviews was analysed to directly examine the effects of FORI on the reading efficacy of the participating students. A comparison of the results from the surveys carried out pre- and post-intervention with teachers and students is presented in Table 4 with the mean percentage increase in the rating for reading efficacy for students identified.

**Table 4.** Percentage rating for reading self-efficacy (pre- and post-intervention).

	Learning Support Teacher Rating %		Class Teacher Rating %		Student Self-Report Rating %		Mean Increase across Ratings
	Pre-Intervention	Post-Intervention	Pre-Intervention	Post-Intervention	Pre-Intervention	Post-Intervention	
Mean scores for all students	$\bar{x} = 43\%$	$\bar{x} = 83\%$	$\bar{x} = 45\%$	$\bar{x} = 70\%$	$\bar{x} = 55\%$	$\bar{x} = 83\%$	$\bar{x} = 31\%$
	Percentage Increase: $\bar{x} = 40\%$		Percentage Increase: $\bar{x} = 25\%$		Percentage Increase: $\bar{x} = 28\%$		

The findings and analysis suggest that the FORI method, as implemented in the current study, had a positive effect on the reading self-efficacy of struggling readers.

#### 3.2. Reading Orientation of Students

The findings from the post-intervention surveys reveal the resoundingly positive impact that the FORI intervention had on students' reading orientation as rated by learning support teachers, class teachers and students. The results from all surveys are presented in Table 5 with pre- and post-intervention data side by side for comparison purposes. The percentage increase in the reading orientation for students, as rated by teachers and students is highlighted with the overall mean rating for the cohort indicated in all cases.

**Table 5.** Percentage rating for reading orientation (pre- and post-intervention).

	Learning Support Teacher Rating %		Class Teacher Rating %		Student Self-Report Rating %		Mean Increase across Ratings
	Pre-Intervention	Post-Intervention	Pre-Intervention	Post-Intervention	Pre-Intervention	Post-Intervention	
Mean scores for all students	$\bar{x} = 34\%$	$\bar{x} = 86\%$	$\bar{x} = 35\%$	$\bar{x} = 73\%$	$\bar{x} = 49\%$	$\bar{x} = 69\%$	$\bar{x} = 36\%$
	Percentage Increase: $\bar{x} = 52\%$		Percentage Increase: $\bar{x} = 38\%$		Percentage Increase: $\bar{x} = 20\%$		

A correlation coefficient of 0.69 for ratings by both sets of teachers indicated a convergence of views on the effects of the intervention on individual students. The mean increase in reading orientation for each student as calculated from all three surveys of 36 percent reported here represents a positive effect of the intervention on reading orientation.

### 3.3. Perceived Reading Difficulty of Students

The third motivational construct provided the context for examining the extent to which students perceived reading tasks as challenging or problematic. For the teachers, student reading difficulty was defined as the belief that ‘reading activities are hard or problematic’ for the child [71] (p. 154). The results of both surveys indicate a high percentage of perceived reading difficulty as reported at the outset of the study by teachers and students (see Table 6).

**Table 6.** Percentage rating for perceived reading difficulty (pre- and post-intervention).

	Learning Support Teacher Rating %		Class Teacher Rating %		Student Self-Report Rating %		Mean Increase across Ratings
	Pre- Intervention	Post- Intervention	Pre- Intervention	Post- Intervention	Pre- Intervention	Post- Intervention	
Mean scores for all students	$\bar{x} = 79$	$\bar{x} = 36$	$\bar{x} = 80$	$\bar{x} = 45$	$\bar{x} = 68$	$\bar{x} = 29$	$\bar{x} = -39\%$
	Percentage Increase: $\bar{x} = -43\%$		Percentage Increase: $\bar{x} = -35\%$		Percentage Increase: $\bar{x} = -39\%$		

Results from quantitative measures employed after the intervention indicate that perceptions of reading difficulty as self-reported by students were significantly reduced. An overall mean rating for perceived reading difficulty of just 29 percent represented an average decrease of 39% per student over the period of the intervention. It is important to remember that, in the data analysis for this construct, a reduced percentage rating represents a positive effect of the intervention.

### 3.4. Statistical Analysis of Reading Motivation Findings

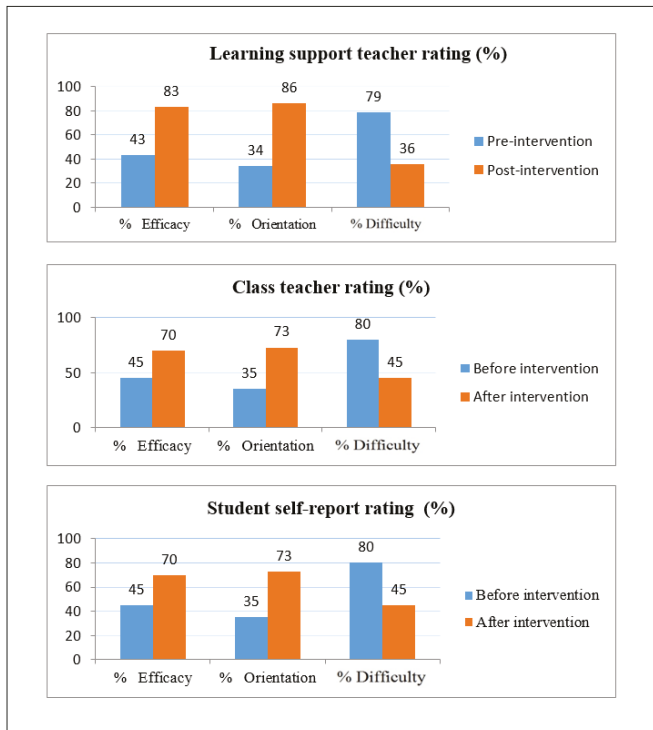
Were there changes over time in the responses in relation to students’ motivation for reading? In other words, did responses by teachers and students significantly differ from the time they were given the questionnaire before the intervention and, again, after the intervention? Total questionnaire responses (pre- versus post-intervention) were compared through the Wilcoxon signed-rank test (paired difference test). In testing the related samples for statistical significance, it was necessary to compare results for all three research informants across the three constructs of motivation included in this study. Hence, statistical information was required on nine discrete comparisons. Results indicated that responses of students did change over time in significant and positive ways. All nine comparisons showed a significant difference for pre- and post-intervention (see Table 7). For example, students’ responses on the post-intervention questionnaire in relation to their self-efficacy for reading ( $\bar{x} = 82.7$ ,  $\sigma = 16.3$ ) were significantly different from their responses on the questionnaire administered before the intervention ( $\bar{x} = 55.1$ ,  $\sigma = 14.92$ ),  $z = -3.4$ ,  $p < 0.001$ . This means that for all three data sources a significant post-intervention improvement was found in perceptions of students’ reading efficacy, reading orientation and perceived reading difficulty.

These statistically significant findings theoretically corroborate the relationship between motivation for reading and fluency oriented instruction [72,73]. This evidence strongly supports the hypothesis that fluency oriented reading instruction has a positive influence on the motivation for reading of struggling readers. A summary of quantitative measures of these effects, as reported by teachers and students, is presented compositely in Figure 7.

**Table 7.** Wilcoxon signed-rank test.

	Measure	Z	p
Class teacher	Reading Self-Efficacy	−3.2	0.002
	Reading Orientation	−3.4	0.001
	Perceived Reading Difficulty	−3.4	0.001
Learning support teacher	Reading Self-Efficacy	−3.3	0.001
	Reading Orientation	−3.4	0.001
	Perceived Reading Difficulty	−3.3	0.001
Student	Reading Self-Efficacy	−3.4	0.001
	Reading Orientation	−3.3	0.001
	Perceived Reading Difficulty	−3.4	0.001

(Comparison of class teacher, learning support teacher and pupil perceptions of reading efficacy, reading orientation, and reading difficulty pre- and post-intervention.)



**Figure 7.** Impact of FORI on student motivation across three constructs.

#### 4. Discussion

As demonstrated above, findings, as reported by all research informants, indicate that the FORI intervention had a positive impact on the motivation for reading of struggling readers in First Class. The impact on students’ motivation for reading derived from quantitative measures was supplemented by evidence gathered during the course of the intervention through interviews, reflective journals and field notes. The major assertion generated from this qualitative evidence after the intervention was that all students had an increased belief in their ability to read well and that the daunting task

of reading challenging texts was no longer insurmountable. In addition to students' growing belief in their ability to read due to mastering the basic skills, all teachers noted an increase in confidence among students reading without the fear of failure. This confidence in their ability as readers was attributed in some instances to the nature of the FORI activities, as exemplified by the comment of one learning support teacher:

*"The way that we conducted the lessons for each unit had a real effect on the children's confidence and self-concept around reading. When they are asked to read there is no fear of making a mistake...even the weakest readers in my group experienced success in every lesson. Of course they still struggled on individual words and needed a lot of support but I found the real key was the gradual release of responsibility." [74]*

This is consistent with research by Bandura [75] (p. 3), who points out that 'successes build a robust belief in one's personal efficacy. Failures undermine it, especially if failures occur before a sense of efficacy is firmly established'. In the course of the intervention, struggling readers experienced success with reading from the outset, through instruction that ranged from teachers modelling the reading process to assisting the student to read independently. Immediately, a high level of engagement among students in the reading process was evident. This engagement appeared to result from a confluence of several factors that can be identified as indicators of an increase in motivation for reading including the level of confidence with which students approached reading. This confidence set the stage for further enhancing students' motivation for reading. Success begets success, and as students became more motivated to engage in the reading process, they subsequently read more frequently and were more successful in their efforts. Thus, a loop of motivation/success/motivation was created, which accounted for students' high level of engagement with the FORI intervention.

While the data was collected and analysed separately in the context of reading efficacy, orientation and perceived difficulty, the findings also identified a synergy among these constructs. Analysis of the data from all research informants indicated that motivational behaviour, as interpreted by each construct individually, was also identifiable as a cohesive unit working together to propel students forward. For example, positive effects of FORI on student reading orientation, as defined by students' interest and engagement in reading, fed into students' self-efficacy for reading. This in turn had the effect of decreasing students' perceived difficulty in reading and increased their confidence in reading, which is the factor that directly improves achievement [76].

In this regard, findings indicate that the impact of the FORI intervention on decreasing student's perceived difficulty with reading was a key factor in establishing the relationship between constructs. Pre-intervention assessment of motivation in relation to this construct indicated that students perceived reading to be a difficult task, had negative attitudes towards reading, and avoided opportunities to read both at school and at home. This was corroborated by data from the assessment of students on the other constructs and was found to impact negatively on students' orientation towards reading. Post-intervention assessment revealed a significant decrease in students' perceived reading difficulty as reported by teachers which was supported by evidence from parents. This finding was attributed to the accessibility of reading for students through FORI activities such as choral reading and echo reading in conjunction with methodologies such as repeated reading. As one teacher commented in a review of the effects of FORI six months after the intervention:

*"It was like someone unlocked the doors of the reading kingdom for children, turned on the lights and invited them to the party ... and they came ... and more importantly they stayed." [77]*

One explanation offered by learning support teachers for the decrease in perceived reading difficulty was the gradual release of responsibility model used in the course of the intervention. Some teachers attributed the more favourable ratings on this item to the advantages of using this model, with particular reference to the benefits of modelling reading:

*“When you take responsibility and model the reading for the child, you remove the fear of making a mistake. At first I wasn’t totally convinced as I thought that they would just learn it off by heart but modelling the reading was so empowering.” [74]*

*“When you read for the children first, everybody experiences success at the same time. You could then release the responsibility at different rates with different children . . . it was real differentiation in action I suppose.” [78]*

*“Modelling first was the key for me. It was so effective. I recorded myself reading the text fluently and then we would all read with the recording . . . you know choral reading. Eventually even the weakest readers were reading with intonation. The way I looked at it was if I was teaching someone to bake a cake I would probably demonstrate first and then give assistance after that as I saw fit.” [78].*

The ratings of these learning support teachers on students’ orientation towards reading also merit particular mention given these teachers were closest to the process as chief implementers of the FORI intervention. The data from their surveys represents an overall mean increase of 52 percent among students with respect to their reading orientation. The following excerpt from a post-intervention interview with one of these teachers is illuminating in the context of these ratings [77].

- R: The reading orientation ratings for some of your students increased dramatically from pre- to post-intervention. Can you tell me more about this?
- LSC1: These children were selected for the intervention because of their lack of motivation for reading and particularly their low level of interest. They would rarely ever read unless you asked them to and would never ask to bring books home. At free play time it was unlikely that they would ever choose a book as their activity even when we had the star system going for the most books read in a week.
- R: And what happened that changed your opinion?
- LSC1: It was amazing to see the transformation as the intervention went on. They loved the games we played each day and were really competitive. I know that they had to bring the FORI books home every night but they also asked to bring other books as well. One child XXXX was so motivated to improve her time on the word dash activity that she wrote all the words down in her copy to practice them at home . . . and the amount they were reading was another dramatic change. It was strange because it wasn’t as if they suddenly became excellent readers. It was that they enjoyed reading and as a result they read more.

The reference here to the increase in the amount of reading by students is representative of findings from all three research sites and is significant in the light of research on intrinsic motivation and reading. The amount that children read influences further growth in reading [79–81] and it is documented that students who are intrinsically motivated spend up to three times more time reading than students who have low intrinsic motivation for reading [50]. This is because intrinsically motivated students are more likely to *choose* to read [37].

The findings relating to the effects of FORI on the motivation for reading also identified some limitations of its efficacy. It was found in the course of the intervention that students’ motivation for reading was influenced very strongly by the degree to which they perceived reading to be difficult. Teachers reported that a student’s confidence in his or her reading ability was often diminished when confronted with text that was too difficult. This was particularly relevant where students continued to have significant difficulties with decoding. Findings thus suggest that FORI strategies may not be effective for students who hold high levels of perceived difficulty in reading unless measures are taken to specifically improve their basic decoding skills. It was found that when students improved in this regard, their perceived difficulty with reading was lessened and they were more likely to regain confidence and to be oriented towards reading. Focusing on decreasing levels of perceived difficulty may help these students improve in reading more than focusing on increasing their interest in reading.

#### *4.1. Role of Parents*

An important finding in this study was the positive role parents played in motivating their children to read. The manner in which they responded to their children was identified by teachers as a critical factor in increasing motivation for reading among students. Many reading initiatives fail because the role of parents as a critical component of the literacy process is overlooked by the school environment [82]. Parents play a central role in determining a student's success at school and have a particularly important role in orienting children towards reading [83]. As part of the FORI intervention, parents were required to read with their child each night, and to sign a home reading log. They were also invited to attend 'reading with your child' sessions organised by teachers. To facilitate this requirement, teachers met with parents and provided specific advice on what to read with their children, how much to read, how long to read, how to respond to mistakes, and how to keep the experience enjoyable [84]. This social aspect of reading was highlighted, in interviews with parents and teachers, as being a significant factor in motivating students to read. Teachers were unanimous in acknowledging the important role that parents played in the improvement in reading orientation in particular among students over the course of the study. They reported that the parents' part in the FORI programme was 'invaluable in motivating the young struggling readers' [74] and 'paid rich dividends when it came to rating children's orientation for reading' [77].

The findings have implications for the role that parents play in motivating struggling readers. They converge in suggesting that children who experience literacy-relevant activities at home, view reading more positively, engage in more leisure reading, and have higher motivation for reading.

#### *4.2. Practical Implications*

While a single study such as this one cannot provide exclusive guidelines on the ways to improve reading instruction for struggling readers, there are some practical implications for teachers that can be learned. The study has found that there is a relationship between fluency oriented reading instruction and motivation for reading. Without recognition of this critical relationship, teachers and particularly learning support teachers may miss out on instructional methods that addresses students' reading deficits and that can enhance their enjoyment of reading. Instructional approaches that do not consider motivational strategies for reading, may not capitalise on the added influence that improving students' motivation for reading has on their long term development as skilled readers. Hence, instruction for struggling readers should be designed in a way that addresses their motivation for reading while simultaneously developing core reading skills.

There are also potential implications for the practice of classroom teachers in primary schools emanating from this study. Findings suggest that practitioners interested in maximising reading achievement among all students should include motivational components in their literacy teaching [85]. The FORI strategies employed in this study are not exclusively designed for the learning support class. Techniques and activities such as choral reading, echo-reading, reader's theatre and antiphonal reading are readily transferrable to the mainstream classroom. In this regard, the study demonstrates that promoting oral reading fluency among students is an imperative responsibility for all teachers of reading.

#### *4.3. Limitations*

There were limitations to this research that require acknowledgement. This is a relatively small-scale project that involved fifteen students from three schools. A larger sample would be more sensitive to possible effect differences in reading motivation among students with particular reading difficulties. Secondly, since the result of this study are based on a limited sample composed of students from schools designated as educationally disadvantaged, care should be taken in over-generalising results. Teachers and students in these intervention schools were operating under more challenging conditions than may be found in other less disadvantaged communities and so the findings from

this study may not have the same implications in other schools. Finally, the study was conducted intentionally with struggling readers in First Class because of the critical period this age represents in a student's reading development. Therefore, we must be careful not to over-generalise the results to primary school students in more senior classes.

#### 4.4. Recommendations for future research

Research has documented that primary schools include large numbers of alliterate students who are capable readers but choose not to read [86]. Given the positive influence of FORI in this study in increasing students' orientation towards reading and interest in reading, there is a need for further research studies that explore the effects of FORI on these students. In other words, enhancing reading motivation should be a concern not only for struggling readers but for all readers.

Additional research featuring a population that differs from the student population in this study is also recommended. This study was conducted in schools comprised of students predominantly from disadvantaged backgrounds. Future research needs to be conducted with struggling readers in schools from non-DEIS backgrounds. These studies would need to include a no-treatment group so specific fluency-building procedures could be contrasted with a control group and contrasted against each other.

There is also a need for longitudinal research that examines the impact of fluency oriented reading instruction on the motivation for reading of different types of readers at different points along the age continuum. Longitudinal studies of the impact of these procedures could clarify how long the intervention benefits can be maintained.

## 5. Conclusions

This study set out to explore the effects of fluency oriented reading instruction on motivation among struggling readers in First Class in Irish primary schools. The findings suggest that reading difficulties for these emergent readers are far from insurmountable. However, the current practice of learning support teachers in teaching struggling readers is disproportionately focused on a bottom-up approach to reading instruction rather than on affective processes. In order for struggling readers to overcome skill deficiencies in reading and to be motivated to continue to read, it is imperative that any negative achievement-related self-beliefs are simultaneously addressed.

To achieve this, there needs to be a shift from a purely cognitive interpretation of reading instruction to a motivational and emotional co-determination of beginning reading skills. A conception of compensatory education for students with reading difficulties would thus embrace the engagement perspective while integrating cognitive, motivational, and social aspects of reading. The fluency oriented reading instruction employed in this study aligns with this conception and has been found to positively influence the motivation for reading of young struggling readers in this study.

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Review

# Assessing Expressive Oral Reading Fluency

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**Abstract:** Educators struggle to assess various aspects of reading in valid and reliable ways. Whether it is comprehension, phonological awareness, vocabulary, or phonics, determining appropriate assessments is challenging across grade levels and student abilities. Also challenging is measuring aspects of fluency: rate, accuracy, and prosody. This article presents a history of fluency in American education with particular focus on assessing expressive oral reading. In addition, the two major approaches to prosody assessment will be explained, and the three most prominent tools for rating expressive oral reading will be analyzed and discussed.

**Keywords:** fluency; prosody; NAEP; MDPS; spectrographic measurement

## 1. History

From the colonial period in America until the early 1900s, one major focus of beginning literacy instruction was expressive oral reading. During the 1600s through the end of the 1700s, “the aim of developing eloquent oral reading was paramount...” [1]. Children were expected to read texts—especially the Bible—expressively. The limited number of suggestions and instructions provided to teachers during this period encouraged use of “exercises for pronunciation and enunciation” [1,2]. Although the types of selections and methods of instruction varied through the mid-1800s, expressive oral reading continued to be stressed in U.S. schools.

A major transition from stressing oral reading to attending to silent reading occurred in the early 1900s, initially led by Francis W. Parker [1]. He distinguished between expression (speech and oral reading) and attention (silent reading). Parker and others argued that silent reading should be preferred over oral reading, because most of the reading that adults do in their lives is silent, and this form of reading leads to greater rate and increased comprehension. This movement toward privileging silent over oral reading was supported by William S. Gray, major author of the popular Dick and Jane books and the preeminent reading figure of his day. This change in focus shifted from performing text to comprehending it [2].

For decades, the attention paid to silent reading and comprehension diverted attention from fluency, including expressive oral reading. The prevailing view then was that once readers had identified the words in text, they would understand what they had read through use of oral language comprehension processes [3]. Reading educators and researchers discussed most effective approaches to reading instruction, focusing on whole word vs. phonics instruction. The ensuing reading wars continued for decades, and fluency instruction was largely overlooked in classroom practice.

In the 1960s and 1970s various models of the reading process were developed, including one in which automaticity of word identification was a key element [4]. As theoreticians began to attend to the necessity of readers to automatically identify words quickly and accurately, some called for teachers to encourage the practice of oral reading fluency with their students. The method of repeated reading [5] and Neurological Impress [6] were developed to help readers increase word identification abilities of students so that they could use more cognitive resources to attend to meaning.

It was in this context that Allington published his article, “Fluency: The Neglected Goal” [7], in which he highlighted the need to return attention to fluency in elementary school instruction. He encouraged attention to developing readers’ rates and accuracy of oral reading, but also reminded teachers to focus on expressive reading. Allington was not alone in reminding teachers of the need to focus on developing fluent readers. Collins compared the prosody of good and poor readers at a time when most of the focus on fluency instruction was rate and accuracy. Collins reported that teachers often focused struggling readers’ attention on saying the words correctly, while proficient readers were encouraged to make the text sound right when they read orally [8].

Even though this research attended to expressive oral reading, the inclusion of prosody in a definition of fluency was not cemented in many people’s minds until the Report of the National Reading Panel in 2000 [9]. With the publication of that pivotal report, most in the literacy research and teaching communities included three aspects of fluent oral reading—rate, accuracy, and expression. However, the ease of assessing rate and accuracy resulted in an emphasis on those two factors over prosody.

## **2. Prosody**

Prosody refers to elements of speech that go beyond ability to produce vowel and consonant sounds to the ability to use appropriate intonation, tone, stress, and rhythm when reading connected text. When young children are first learning, they read orally, not silently. Caregivers and others read orally to preschoolers, and their first attempts at reading are oral. As beginners, many children read with very little expression when they try to verbalize the words they see in text. As their word identification becomes more automatic, they increase their rate of reading, allowing them to allocate cognitive resources to comprehension and oral reading expression [10].

Many teachers and others prompt children to make their oral reading sound like they are talking, not reading with a monotone voice. “When a child reads prosodically, oral reading sounds much like speech with appropriate phrasing, pause structures, stress, rise and fall patterns, and general expressiveness” [11].

Prosody seems to be closely associated with reading comprehension. Even though researchers discuss fluency differently, most agree that the link between fluency and students’ understanding of the text they encounter is substantial. Those who read with good expression also tend to have better reading comprehension abilities than can be explained by reading rates alone [12]. They recognize the phrasal and syntactical structures the author is using and are able to deliver the text orally as the author intended. However, this alone does not guarantee comprehension. It appears that oral reading fluency can sometimes limit or support comprehension [13]. When children read very slowly and with poor accuracy, their comprehension can suffer, even if they read expressively. As children read faster and with greater accuracy, their reading comprehension can also increase, even if their prosody does not improve. Thus, as children increase their rate, accuracy, and expression, a question arises: Does improved prosody lead to greater reading comprehension, or does comprehension of text lead to the ability to read with greater expression?

Although the research is not conclusive, it seems to indicate that there are differential implications for both proficient and struggling readers. “Some researchers have suggested that becoming a fluent reader has more to do with focusing on meaning construction than it has to do with attending to the words on a page” [14]. As proficient readers attend to meaning during reading, their oral reading expression demonstrates their understanding. But expressive oral reading influences struggling readers in a different way. Strugglers are typically more focused on word identification. As they work to identify words, the flow of the text is interrupted and their lack of expressive reading demonstrates their poor understanding [15]. The best way to characterize the research on prosody and reading comprehension may be summed up by Schwanenflugel and Kuhn: “It has been argued that the relationship between fluency and comprehension is bidirectional: both reciprocal and interactive” [15].

### **3. Approaches to Prosody Assessment**

Teachers provide instruction and model oral reading to help children develop their own reading fluency abilities. In addition, they need to assess children's fluency development, including expressive oral reading. Assessing oral reading rate and accuracy is relatively straightforward. Teachers and researchers can easily measure students' reading rates by establishing the number of words students read per minute (wpm). They can also measure the number of words students read correctly as they read (wcpm). The 2002 NAEP assessment of fluency for fourth graders showed that students read at an average rate of 119 words per minute, and that 90% of students read at least 95% of words accurately, when scoring only meaning-change miscues as errors. As rate of reading increased, comprehension scores also increased. Measuring effective prosodic reading, however, is more challenging.

Two general approaches to assessing expressive oral reading have been developed. One approach does not depend on rater judgments of students' reading, opting instead for a more objective method. Recordings of oral reading are analyzed by automated means to measure elements of speech, such as pitch, intensity, and duration [16,17]. In a second approach, human raters make subjective judgments about individuals' prosodic reading utilizing rubrics that describe various aspects of expressive oral reading [14,18].

### **4. Methodology**

As we reviewed the literature on both of these approaches, we employed the following methodology. We first identified leading search engines used for academic literature reviews: Google Scholar (scholar.google.com); ResearchGate (researchgate.net); and VirtualLRC (cse.google.com). We then used the following search terms to locate relevant articles: assessing expressive oral reading; NAEP fluency 2002; Multidimensional Fluency Scale; Comprehensive Oral Reading Fluency Scale (CORFS).

We focused on articles that appeared in the results of searches conducted in at least two of the search engines. We then focused on studies that appeared consistently in the reference lists of these articles. We also paid close attention to studies that had been conducted in international settings to indicate the widespread use of these assessment measures.

### **5. Automated Assessment**

One method to gauge an individual's expressive oral reading is to examine recordings of specific features of speech [11]. After recordings of an individual's reading have been made, the contours of their speech are analyzed using computer software programs that depict them visually. The software that is commonly used for this is Praat, developed in 2001 by Dutch researchers, Paul Boersma and David Weenink [19,20]. It has undergone several revisions and remains the most important tool for analyzing speech because it is easily available and user friendly.

Praat has been used by linguists in the field of phonetics to study specific features of speech to understand the sound patterns of normal English [21]. The Praat software has also been used to teach those learning English as a foreign language (EFL) to understand prosodic features of English [22]. As individuals become more aware of the sounds of English, they can practice in more focused ways and use the language in ways that sound more like native English speakers. In addition, Praat software has been used to assist those who have been affected by vocal cord paralysis. By examining their speech patterns as they try to improve their speech production, patients can learn to more closely match the pitch and pause patterns in English [23].

The most common automated assessment in education settings provides spectrographic measurements of speech. Analyses of the graphic displays of oral reading can highlight specific elements. The two most common aspects of oral reading that have been examined using this software are pauses and pitch [24]. Various elements of both have been measured using Praat software to provide greater understanding of readers' prosodic practices.



When analyzing pauses in recorded oral reading, examiners consider the ratio of actual and grammatically-expected pauses within sentences. This analysis can determine if a reader's pauses are expected and appropriate, or if they tend to be ungrammatical and indicate unjustified pausing practices [24]. The more closely a reader's actual number of pauses match those expected by the grammar of the text, the more reliably researchers can judge whether or not the child is reading with appropriate phrasing.

When evaluating pitch in oral reading, examiners consider how readers raise and drop their voices. Effective readers are more emphatic in pitch variation than struggling readers [25]. The magnitude of the decrease in pitch during reading is measured to determine whether the declination is appropriate. Measuring pitch of oral reading also examines the general up and down pitch swings in a reader's voice. These variations in pitch are generally considered to be equated with appropriate expressive reading. When such variation of pitch is not present in a child's oral reading, the reading usually comes across as flat and monotone.

Along with pausing and pitch, stress is another property of prosody. However, stress is difficult to isolate and measure because it includes broader concepts, including pitch, duration, and intensity [26–28]. When teachers focus attention on pitch, issues related to stress will generally improve as well [29].

Nationally and internationally, researchers have used automated assessment of prosody. Researchers in Spain [30] asked 103 third- through sixth-grade students to orally read four expository texts and answer comprehension questions. Using Praat software, they measured typical aspects of prosody and found that children with lower levels of reading comprehension made more inappropriate pauses and unacceptable levels and durations of pitch compared to more able readers.

Ardoin et al. examined the role of repeated readings and wide reading in improving multiple dimensions of reading, including fluency. They asked 168 second graders to practice reading four times each week over a nine-week period. Using the Praat software, they found that both repeated reading and wide reading were effective in improving reading fluency, which in turn affected other reading behaviors, including expressive oral reading. The second graders in this study improved in both pitch and pause scores [31].

Researchers have examined pitch and pause durations and changes during oral reading to measure prosodic reading of adult readers. They examined these aspects of expressive reading in relation to adult readers' scores on tests of decoding, word identification, and comprehension. For those with limited reading skills, patterns of pausing accounted for a significant amount of variance in comprehension scores [32].

## **6. Human Assessment**

In addition to automated, spectrographic measurements of expressive oral reading, educators can instead use rating scales to judge quality of prosody. Rubrics establish criteria for human judgment of acceptable performance of specific tasks. They are commonly used to in classroom settings to systematically evaluate student's abilities and behaviors, especially with processes that are not easily measured in other ways. A performance can be designed to measure a student's ability, knowledge, and skills. For example, a student may be asked to demonstrate some physical or artistic achievement, play a musical instrument, create or critique a work of art, or improvise a dance or a scene. These kinds of performances, tasks, projects, and portfolios can be scored using rubrics. Rubrics allow researchers and teachers to clarify components of a skill and permit them to make judgments about what students know and can do in relation to specific objectives. Observers can use rubrics to judge the degree, frequency, or range of student behaviors and understand the degree to which a student has mastered a skill [33].

Some rubrics provide for holistic evaluation. Using a global approach, a set of interrelated tasks is identified that contributes to the whole. Using this type of rubric, a teacher or researcher can evaluate

quickly and efficiently to provide an overall impression of ability. However, holistic evaluations do not provide the detail available in analytic approaches.

Analytic rubrics break down a final product into component parts, and each part is scored separately. The total score of a student’s performance is the sum of all parts. Each component can be evaluated and provide teachers with specific information about strengths and weaknesses that can guide instructional choices to help students improve.

Whether holistic or analytic rubrics are used, several significant issues need to be addressed. Raters’ understanding of the scoring task and their ability to score observed behaviors in consistent ways are essential when making judgments about student performance. Consistency within an individual evaluator is also important—this is, does the rater score the performance in a similar manner on more than one occasion? Also, how many raters are required for confidence in scores? How similar are raters’ scores on the same performances? Are their ratings similar on different occasions? Differences in scores may also be related to the task at hand. For example, the passages students read aloud may influence their abilities to perform well.

Currently, the two most commonly-used rating rubrics are the NAEP and the MDFS. However, another rating instrument, CORFS, has also been developed recently. The rating method created and used by the National Assessment of Educational Progress (NAEP) is a holistic measure [14,34]. The Multidimensional Fluency Scale (MDFS) is an analytic approach that measures four dimensions of expressive oral reading [35]. The Comprehensive Oral Reading Fluency Scale (CORFS) uses two factors to measure prosodic reading analytically [24].

6.1. NAEP

This measure was developed for the 1992 NAEP assessment, the first time that fluency was assessed since NAEP began 25 years earlier. The prosody measure was developed by Gay Sue Pinnell, John J. Pikuiski, Karen K. Wixson, Jay R. Campbell, Phillip B. Gough, and Alexandra S. Beatty, who all served on the NAEP fluency committee [14]. Fluency has only been measured one additional time for fourth graders in 2002. In both cases, NAEP used the same instrument to measure rate, accuracy, and fluency, the term they used to describe prosody. These scholars designed this holistic measure that focuses primarily on phrasing, syntax, and expression: “In this study, fluency was considered a distinct attribute of oral reading separate from accuracy and rate. Fluency was defined in terms of phrasing, adherence to the author’s syntax, and expressiveness, and was measured at one of four levels (1–4, with 4 being the measure of highest fluency) on NAEP’s Oral Reading Fluency Scale.” Those who scored in levels three and four were considered to be fluent, and those who scored in levels one and two were non-fluent (see Table 1). Although there was a new committee in 2002, they chose to use the exact same prosody measure. [34].

**Table 1.** National Assessment of Educational Progress (NAEP) Fluency Scale.

Category	Level	Description
Fluent	4	Reads primarily in larger, meaningful phrase groups. Although some regressions, repetitions, and deviations from text may be present, these do not appear to detract from the overall structure of the story. Preservation of the author’s syntax is consistent. Some or most of the story is read with expressive interpretation.
	3	Reads primarily in three- or four-word phrase groups. Some small groupings may be present. However, the majority of phrasing seems appropriate and preserves the syntax of the author. Little or no expressive interpretation is present.
Non-fluent	2	Reads primarily in two-word phrases with some three- or four-word groupings. Some word-by-word reading may be present. Word groupings may seem awkward and unrelated to larger context of sentence or passage.
	1	Reads primarily word-by-word. Occasional two-word or three-word phrases may occur—but these are infrequent and/or they do not preserve meaningful syntax.

The fluency assessment method called for individual interviews with a sample of fourth graders during which they were recorded reading one page of text orally. Recordings were analyzed by trained raters who used the rubric that had been developed. In 2002, a sample of 1779 fourth-graders from the total of 140,000 students included in the NAEP reading assessment were interviewed. Findings revealed that 10% of all readers were rated in the highest, or fourth, level of expressive reading, and 51% of the sample were rated in third level. The overall mean score for the 2002 fourth grader sample was 2.64 out of a possible 4 points. Additionally, data showed that as rate, accuracy, and prosody increased, so did comprehension. These results demonstrated a strong relationship between fluency and comprehension: “Skilled readers not only recognize and read words quickly, but also deliver a smooth oral reading performance that reflects their understanding of the text they are reading.” These authors report that two raters scored each oral reading with an intraclass correlation of 0.82. The number of rating occasions beyond one is unknown [34].

A number of studies have used NAEP to examine expressive oral reading. Morris et al. examined rate, accuracy and prosody of first graders reading short passages to determine which factors best predicted scores on fluency ratings. Using the NAEP fluency assessment measure, they found that rate and phrasing surfaced as the best predictors [36].

In a study of second graders, Tortorelli utilized a statewide assessment database of rate, accuracy, prosody, and comprehension. The prosody score was obtained using the NAEP measure. She compared results of those who read slowly to four other groups: those with generally high skills; those with high accuracy and low rate scores; those with low accuracy and high rate; and those with generally low scores. She found that those who struggled with accuracy also demonstrated difficulty with comprehension. Those who struggled with rate also demonstrated difficulty with prosody [37].

In summary, the NAEP measure shows variability in expressive oral reading with a 2002 mean fluency score of 2.64. When two raters are used, the instrument is found to be reliable (correlation of 0.82). In the 2002 NAEP assessment, nearly two-thirds of the fourth graders read at a fluent level. Phrasing, a key element of prosody, surfaced as a predictor of overall fluency. This scale also showed that those who struggle with word identification also demonstrated low prosody.

## 6.2. MDFS

The Multidimensional Fluency Scale (MDFS) has also been used to assess expressive oral reading. This measure was initially developed by Zutell and Rasinski [18], who were influenced and motivated to do so by the work of two groups of researchers, Allington and Brown [38], and Aulls [39]. Zutell and Rasinski noted that both groups of scholars had identified specific elements of prosody [18], and that Aulls had created a rough scale for observing stages of reading fluency (word-by-word reading and phrasing, and expression). However, Aulls did not include all of the same elements that Zutell and Rasinski had described in greater detail in their initial Multidimensional Fluency Scale [18]. Zutell and Rasinski were also influenced by the NAEP prosody rating scale that was being developed for use in 1992. The MDFS was “an elaboration of the fluency rubric used in the NAEP studies of oral reading [14,34] that reported significant correlations (predictive validity) between oral reading prosody and fourth-grade students’ silent reading comprehension” [35]. Unlike the NAEP scale, the MDFS utilized an analytic scoring system, using four levels, from low to high prosody focusing on three domains of expression—phrasing, smoothness, and pacing. A separate score for each of the three traits of expressive reading was given.

The MDFS changed from the original three to four dimensions of prosody in 2003, when the additional aspect of expression and volume was given [40]. Table 2 shows the current MDFS that consists of a four-point scale for four specific dimensions of fluency—expression and volume, phrasing, smoothness, and pacing.

**Table 2.** Multidimensional Fluency Scale (MDFS).

Dimension	1	2	3	4
Expression and Volume	Reads with little expression or enthusiasm in voice. Reads words as if simply to get them out. Little sense of trying to make text sound like natural language. Tends to read in a quiet voice.	Some expression. Begins to make text sound like natural language in some areas of the text, but not others. Focus remains largely on saying the words. Still reads in a quiet voice.	Sounds like natural language throughout the better part of the passage. Occasionally slips into expressionless reading. Voice volume is appropriate throughout the text.	Reads with good enthusiasm throughout the text. Sounds like natural language. The reader is able to vary expression and volume to match his/her interpretation of the passage.
Phrasing	Monotonic with little sense of phrase boundaries, frequent word-by-word reading.	Frequent two- and three-word phrases giving the impression of choppy reading; improper stress and intonation that fail to mark ends of sentences and clauses.	Mixture of run-ons and mid-sentence pauses for breath, and possibly some choppiness; reasonable stress/intonation.	Generally, well phrased, mostly in clause and sentence units, with adequate attention to expression.
Smoothness	Frequent extended pauses, hesitations, false starts, sound-outs, repetitions, and/or multiple attempts.	Several “rough” spots in text where extended pauses, hesitations, etc., are more frequent and disruptive.	Occasional breaks in smoothness caused by difficulties with specific words and/or structures.	Generally smooth reading with some breaks, but word and structure difficulties are resolved quickly, usually through self-correction.
Pacing	Slow and laborious.	Moderately slow.	Uneven mixture of fast and slow reading.	Consistently conversational.

To use the MDFS, raters make judgments about individuals’ prosodic reading in each of the four dimensions. The descriptions of the levels allow raters to make consistent decisions about readers’ performances. However, with so many decisions required of raters, questions arise about the reliability and validity of the scores obtained using this instrument.

The reliability and validity of scores obtained using the MDFS have been established by various researchers. Zutell and Rasinski said that “initially teachers often feel insecure in making ‘subjective’ judgments; they are concerned about issue of reliability and validity” [18]. To alleviate these concerns, they conducted research to show that fluency ratings are strong predictors of results on standardized reading tests [41]. Further, they showed that with training, university teacher candidates could learn to apply to rubric accurately and consistently [42]. The training of raters is important to ensure reliability of scores, but questions remain about the number of raters, passages, and rating occasions that are required to obtain reliable scores. The combination of raters, passages and occasions also make the feasibility of using the MDFS an issue.

Moser, Sudweeks, Morrison, and Wilcox addressed these specific issues in a generalizability study of ratings of 36 fourth- graders’ reading. For three days each week over a seven-week period, these students practiced fluent oral reading of passages from both genres. At the conclusion of that practice period, students read four passages—two narrative and two informational—to their teacher, the lead researcher in the study. All readings were recorded so that expressive oral reading could be assessed on different occasions. The 144 readings were evaluated using the MDFS by two trained raters on two separate rating occasions.

Results show the mean score for expression and volume was 3.11, phrasing was 3.25, smoothness was 3.12, and pace was 3.06, with an overall mean of 12.54 out of 16 [43].

Generalizability theory methods were used to evaluate the rating scores. These procedures provided a way to simultaneously estimate main effects and interaction effects through the analysis of mean ratings. Generalizability theory goes beyond the traditional ANOVA in that it can be used to estimate the relative percentage of measurement error from multiple facets. In this way, researchers were able to estimate the reliability of scores obtained using the MDFS. By using Generalizability theory, researchers also examined effects related to raters, rating occasions, and passages. Results were used to estimate the number of raters, rating occasions, and passages that are required to obtain reliable scores for expressive oral reading.

Results showed very high MDFS reliability scores, ranging from 0.92 to 0.98. Findings also showed that a minimum of two, and preferably three, equivalent passages, two raters, and one rating occasion are recommended to obtain reliable ratings. Like the research by Zutell and Rasinski, this study also demonstrated the value of training raters and encouraging them to collaborate during training sessions. In addition, this study showed the necessity of using multiple passages along with multiple raters. Most important, this study found that highly reliable expressive oral reading scores can be obtained using the MDFS and assures researchers and teachers that it can be used to measure expressive oral reading.

Smith and Paige were interested in examining the reliability of scores on prosodic reading that can be obtained using both the NAEP fluency scale and the MDFS. They sought to compare these two measures of prosody. Like Moser et al., they also used Generalizability theory. They trained four doctoral students to use both the MDFS and NAEP to rate children's oral reading. Results showed an average NAEP score of 2.54 out of 4 on the first occasion and 2.70 on the second. They also showed scores of 10.09 out of 16 and 10.76 on the two separate occasions using MDFS [44]. Children in first, second, and third grade orally read one grade-level, narrative passage from the Gray Oral Reading Test-5 [45]. All readings were digitally recorded so that ratings of prosody could be completed. The four raters judged the oral reading of 177 readers on two occasions.

These researchers measured the amount of variance contributed by differences in raters, rating occasions, and students. Reliability coefficients were very similar for the MDFS and the NAEP. Results showed high reliability scores for each of the three grade levels, ranging from 0.91 to 0.94 for both rating instruments. Results showed slightly higher reliability scores for the MDFS than the NAEP, but the two measures were highly correlated with no significant differences in scores obtained from the two instruments.

Although the MDFS and NAEP produced similar results, the MDFS was slightly more efficient than NAEP in regard to measurement design resources. To obtain desired results, the MDFS required only two raters, as opposed to three needed when using the NAEP instrument. MDFS provided a deeper analysis of the quality of reader fluency, due to the analytic nature of the MDFS and the holistic quality of the NAEP measure. The precision of information from the MDFS can better inform instruction. Training raters was essential to obtain reliable scores, regardless of which rating scale was employed.

The MDFS has been used in a number of studies that examined expressive oral reading. Dutch researchers examined the oral reading of 106 fourth graders to see what aspects are closely associated with reading comprehension. They used the MDFS to measure prosody. Regression analyses showed that prosody, not rate, was most closely linked to comprehension scores [46]. Similarly, Turkish researchers examined the oral reading of 132 fourth graders. Using the MDFS, they showed a strong relationship among attention, reading speed, and prosody [47].

Repeated readings have been suggested as a way to improve oral reading fluency. Guerin and Murphy used the MDFS in their study of struggling adolescent readers. Results showed that over a seven-week period of repeated reading, all aspects of fluency improved, leading to more strategic reading and improved comprehension [48].

In summary, the MDFS measure shows variability in expressive oral reading with mean fluency scores of 10.76 out of 16 in the Moser et al. study and 12.54 in Smith and Paige. This instrument had a reliability score of 0.92–0.98 for the Moser et al. study and 0.91–0.94 in Smith and Paige. These reliability scores assume two raters and one rating occasion. Other researchers using this scale have found that prosody better predicts comprehension than rate, even though the two have a strong relationship. Another result is that improved expressive reading can lead to greater reading comprehension.

6.3. CORFS

The Comprehensive Oral Reading Fluency Scale was developed in 2013 by researchers who had used automated means of assessing prosody [24]. They sought to create a spectrographically-grounded rating scale. As a result, the two features of prosody measured with this rubric were intonation (pitch) and pausing (see Table 3). There are four possible rating levels for both dimensions.

Table 3. Comprehensive Oral Reading Fluency Scale (CORFS).

Automaticity (Circle Rating)		Expression (Circle Ratings)			
Rating	WCPM	Intonation Rating	Appropriate Intonation	Pausing Rating	Natural Pausing
8	137+	4	<ul style="list-style-type: none"> <li>Makes noticeable pitch variations throughout to communicate meaning.</li> <li>Makes appropriate and consistent end-of-sentence pitch changes.</li> <li>One or two exceptions may exist.</li> </ul>	4	<ul style="list-style-type: none"> <li>Pauses may be used to convey meaning.</li> <li>Between-sentence pauses are short but natural.</li> <li>Unexpected pauses occur less than once per sentence on average.</li> </ul>
6	107–136	3	<ul style="list-style-type: none"> <li>Varies pitch appropriately and makes appropriate end-of-sentence pitch changes most of the time.</li> <li>Some flatness may exist, but intonation effectively communicates meaning overall.</li> </ul>	3	<ul style="list-style-type: none"> <li>May have brief unexpected pauses once or twice per sentence, but pauses seem to be used mainly to distinguish phrases and sentences.</li> <li>Longer pauses are rare and only momentarily interrupt the flow of the text.</li> </ul>
4	78–106	2	<ul style="list-style-type: none"> <li>Intonation is frequently flat or does not match the punctuation or meaning/phrasing of the text.</li> <li>Shows appropriate pitch variation on a few sentences but is flat or unnatural on many others.</li> <li>Overall impression is that intonation does not effectively communicate meaning.</li> </ul>	2	<ul style="list-style-type: none"> <li>Frequent pausing within sentences.</li> <li>May also have some lengthy pausing between sentences.</li> <li>May pause often between phrases or three- or four-word groupings.</li> </ul>
2	1–78	1	<ul style="list-style-type: none"> <li>Reads with flat or other unnatural intonation throughout.</li> <li>Does not mark sentence boundaries with distinct pitch changes, except occasionally.</li> </ul>	1	<ul style="list-style-type: none"> <li>Reading is broken and effortful with numerous pauses throughout.</li> <li>Reads primarily in groups of one or two words without pausing.</li> </ul>

Benjamin et al. thought that this instrument would be an advance over MDFS and NAEP because of its grounding in the more objective spectrographic research literature on reading prosody [24]. CORFS assesses the three components of fluency (i.e., rate, accuracy, and prosody) simultaneously by incorporating measures of all three components, capitalizing on the published grade-level reading rate norms by Hasbrouck and Tindal [49]. Benjamin et al. emphasize the understanding that fluency serves as a support for comprehension and that reading prosody is a critical component in this process [24].

In the development of CORFS, developers carried out two studies to evaluate its validity. In the first, three raters judged the expressive reading of 59 second graders. High degrees of correlation were found between these expression ratings and standardized assessments of reading comprehension and spectrographic measures of fluency. In the second study, 60 third graders read two texts and were evaluated using spectrographic measures. Then two raters independently evaluated the recordings using CORFS. Comparisons between the two prosody measures showed comparable results.

To our knowledge, this instrument has not been used by researchers outside those who developed it or who are involved in spectrographic research, although it has been cited by other researchers [50,51]. On other occasions the developers have suggested CORFS as a resource for other researchers [52,53].

In summary, the CORFS measure shows high correlations with spectrographic scores and traditional reading assessment scores. The mean CORFS score for total expression was 5.78 out of 8 and the interrater reliability coefficient was 0.99. Because it has not been used widely, it is not yet possible to discuss findings from studies using this instrument.

## **7. Discussion**

Two general approaches have been used to evaluate expressive oral reading, automated assessment and human judgment. Bolaños et al. have completed a study using both [54]. They examined oral reading of first through sixth graders who read one of 20 passages written at their grade level in a one-minute timed reading. The 783 total recordings were evaluated for rate, accuracy, and expression using both automated and human scoring systems. The automated approach was developed by the authors who also trained teachers to calculate wcpm and then rate prosody using the NAEP scale [55].

Results showed high agreement between scores obtained using automated assessments and human ratings for both wcpm and prosody. The agreement between human and automated ratings of expressive oral reading were higher (90.93%) when judging between the fluent (levels 3 and 4) and non-fluent (levels 1 and 2) NAEP categories (76.05%). Nevertheless, the agreements were high enough that the authors conclude that we could settle for using automated ratings of all three aspects of fluency.

The concerns raised by other researchers are that digital measures may not accurately assess all dimensions of fluency [56]. For example, Smith and Paige reported higher reliability results for NAEP than those reported in the Bolaños study [44]. The MDFS, not used in the Bolaños study, has also been shown to yield highly reliable scores [43]. Automated tools are limited to measuring only pitch and pauses, leaving out other dimensions of prosody like smoothness and phrasing, which human raters may be better equipped to evaluate. Automated assessment can minimize qualitative relationships. For example, pitch and pausing contours may not always be correctly associated with the linguistic elements in the text. The same passage can be appropriately read with multiple prosodic patterns by proficient readers, while struggling readers may exhibit pauses and pitch differences that are not appropriate. There are times when words in a text can be grouped into more than one acceptable way and still preserve meaning. These groupings may not all be grammatically correct, and a spectrographic analysis generally would not accept such variations. A human rater can pay attention to why students are pausing as they read (e.g., to check what they've read, to decode the word they are currently reading, to anticipate an upcoming word, to take a break in their reading because they are tired). Spectrographic research can document these pauses, but only a human rater has the potential of understanding why.

On the flipside, use of human rating scales of prosody also has potential drawbacks. Whenever multiple raters are used, reliability and validity issues are drawn into question. Researchers have

shown that training of raters is essential to ensure inter- and intra-rater reliability. But that takes time and effort, which may not always be practical in a school setting.

Different rating scales have included different traits of prosody, showing disagreement about what constitutes expressive oral reading. Human raters make subjective judgments. Although such judgments can be tempered with multiple raters, passages, and rating occasions, educators may not have the luxury to go to such lengths. Human raters can make a holistic judgment using NAEF, but when using MDFS or CORFS they must make multiple decisions at the same time. It is difficult to make separate judgments for each dimension, and time consuming to listen to the recording multiple times to rate each dimension separately.

## 8. Conclusions

Recognizing the limitations of both types of assessment, perhaps the decision of which to use needs to be made by considering practical issues. Researchers may have access to the technology required for automated assessment, but most teachers will not. Those who can use this technology, may find that it saves time. But results may not inform instruction as effectively as one-on-one testing or listening to recordings. Teachers may be able to obtain the information they need about prosody without having to deal with multiple raters and rating occasions. Researchers, on the other hand, have to make careful and defensible choices about multiple raters, passages, and occasions to ensure the validity and reliability of their findings.

Whether teachers or researchers, one thing is clear—we have to measure all aspects of reading and not just decoding. If we are serious about improving children’s comprehension, there is a place for assessment of expressive oral reading. If we take the time to teach and measure elements of prosody, we can make room for meaning—the primary purpose of reading.

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Article

# Assessing the Word Recognition Skills of German Elementary Students in Silent Reading—Psychometric Properties of an Item Pool to Generate Curriculum-Based Measurements

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**Abstract:** Given the high proportion of struggling readers in school and the long-term negative consequences of underachievement for those affected, the question of prevention options arises. The early identification of central indicators for reading literacy is a noteworthy starting point. In this context, curriculum-based measurements have established themselves as reliable and valid instruments for monitoring the progress of learning processes. This article is dedicated to the assessment of word recognition in silent reading as an indicator of adequate reading fluency. The process of developing an item pool is described, from which instruments for learning process diagnostics can be derived. A sample of 4268 students from grades 1–4 processed a subset of items. Each student template included anchor items, which all students processed. Using Item Response Theory, item statistics were estimated for the entire sample and all items. After eliminating unsuitable items ( $N = 206$ ), a one-dimensional, homogeneous pool of items remained. In addition, there are high correlations with another established reading test. This provides the first evidence that the recording of word recognition skills for silent reading can be seen as an economic indicator for reading skills. Although the item pool forms an important basis for the extraction of curriculum-based measurements, further investigations to assess the diagnostic suitability (e.g., the measurement invariance over different test times) are still pending.

**Keywords:** curriculum-based measurement; fluency; silent reading; word recognition skills; item response theory

## 1. Introduction

Learning disabilities have numerous negative impacts on the educational progress of affected students. Not only is it assumed that school difficulties are consistent throughout the time of a student's school career [1–3], but the problems can also be observed up to adulthood [1]. Against the background of these findings, the proportion of children with problems in learning in Germany is very worrisome. In a Germany-wide survey in 2016, the reading performance of almost 30,000 fourth graders was examined against the background of nationwide standards [4]. In the sample, more than 12% of the children did not reach the minimum standard. These children are therefore able to read simple texts and understand their meaning, but the information must be explicitly specified in the text. To ensure a successful transition to secondary education, intensive support for these children is necessary. Only about 10% achieved the optimum standard, which means that these children can cope with clearly demanding requirements. They can think independently about texts, grasp topics and motives that are not explicitly given in the text, and draw complex conclusions. About 65% of the tested children

reached the minimum standard in reading. The results underline the need for specific support for those affected as early as possible, as spontaneous remission cannot be assumed [5].

Similar findings in the USA led to far-reaching legal reforms. With the No Child Left Behind Act in 2001, various standards were enacted to optimize the quality of teaching and support. These include universal screenings on identifying children at risk, better-trained teachers and support staff, and the use of evidence-based instruction and intervention. Moreover, high-stakes assessments have been developed to evaluate the quality of teaching. In this context, curriculum-based measurements (CBM, see below) have gained in meaning. In the context of a response-to-intervention model, CBM provide ongoing information on the learning progress during the school year. On this basis, data-based decisions as well as a formative evaluation of instruction and student support can be made to optimize the teaching-learning framework [6].

The situation in Germany varies considerably [7]. Although there are regular, nationwide tests, whose results are used to assess the effectiveness of the school system, there are no consequences for individual schools (in the sense of direct assumption of responsibility). The approval of financial and human resources to support children with learning problems in Germany requires an official diagnosis of disabilities (e.g., dyslexia). Only then will children have access to additional educational resources. Accordingly, diagnostic measures serve to determine the need for support and do not indicate the need for the adaptation of instruction. Data-based decision-making processes and formative evaluation of the instruction based on standardized data are unusual [8]. This is because teachers cannot judge the idea behind them and the significance of their use [8]. In addition, the selection of suitable progress monitoring instruments such as CBM is still limited, but constantly growing [9,10]. Against the background of these aspects, this paper presents the construction and evaluation of an item pool from which economic CBM instruments for primary schools in German-speaking countries can be generated. We assume that the word recognition skills can serve as an indicator to screen for low reading fluency skills.

## **2. Reading Fluency**

One of the most important goals of school attendance for all primary school students is the successful acquisition of reading skills. From the transition to secondary school onwards, it is assumed that students will be able to independently extract and understand information from texts [11]. Historically and currently, much importance is attached to reading fluency in connection with the acquisition of reading skills [12,13]. The literature reveals a multitude of attempts to define reading fluency [14–16]. Current attempts see fluency as the result of a successful interplay of different basic competencies [13,17]. The US-American National Reading Panel [16] published a frequently cited definition. They describe fluency as the ability “to read orally with speed, accuracy, and proper expression” [16] (p. 5). Accordingly, reading fluency is a process of appropriate recoding and decoding of what has been read, the quality of which depends on various aspects, such as reading accuracy and phonological, orthographic, and morphological abilities [12,13,17–19].

Reading fluency, however, is not only the outcome of a successful combination of different partial competences, but also often seen as a prerequisite for higher reading skills [20,21]. In this context, emphasis is placed on the speed of reading [12,22,23]. The basic assumption is that insufficient word reading skills (slow, stagnant, and erroneous decoding) is an obstacle to the contraction of individual information into larger units of meaning. This in turn complicates the processes of activating prior knowledge, integrating new information into existing knowledge structures, and metacognitive control processes [21]. Only when the word reading process is automated do resources become available for higher forms of information processing, i.e., more complex reading processes [16,24–26]. Especially in the first years of school, clear connections between the ability to quickly recognize and decode words and reading comprehension can be empirically depicted [27,28]. With increasing reading experience, the students’ mental lexicon expands, and frequent combinations of sounds, morphs, and words are stored and linked. Automated word recognition and rapid decoding thus form the basis for

appropriate reading fluency at the sentence and text level, which is in turn necessary for the successful understanding of meaning [12,29].

Against the background of the different understandings of reading fluency listed above, it becomes clear that early interventions are necessary to promote reading fluency in order to prevent reading problems [20,30,31]. Reading fluency should therefore be understood in a development-oriented way [20]. Attention should be paid to it even at the beginning of reading acquisition. At this point, this concerns aspects of phonemic segmentation, alphabetic understanding, phonics, and orthography [12,30], as well as word recognition [32]. As with reading fluency, word recognition skills can be seen as an outcome, as well as a predictor. As a result of the interplay of letter and sound knowledge, as well as decoding abilities, word recognition skills serve as an outcome variable [16,33].

According to the National Reading Panel [16], fluency is the direct result of successful word recognition. Overall, word recognition skills can be assumed to be a potential indicator of reading fluidity [12,13]. In this sense, the assessment of word recognition skills (amount of words read identified correctly within a limited time span) over time plays an important role in preventing reading difficulties. According to the study by Speece and Ritchey [34], word recognition skills develop at the same time as the first word recognition processes and are therefore already important in grade 1. At the end of grade 2, most students should have acquired fundamental word recognition skills [35], and by the middle of grade 4 at the latest [36]. The assessment of basic reading skills, such as the precise recoding and decoding of words, should be a goal of instruction in the first grades at school [33]. Based on this data, further pedagogical decisions can be made.

### **3. Assessing Reading Fluency with Curriculum-Based Measurements**

Curriculum-based measurements (CBM) [37] are a very prominent approach for progress monitoring of academic skills. CBM were developed in the USA and already have a long research tradition there, especially in the fields of reading, writing, and mathematics [37–39]. The original aim of the use of CBM was to provide teachers working in special education with reliable and valid data for assessing the development of students, in order to support instructional decisions [37]. These short test procedures can be used regularly at short intervals. Within a time limit of only a few minutes, the children have to solve as many tasks of a test as possible. Due to the repeated application, the monitoring of academic progress can be derived [40]. On the one hand, CBM can be easily implemented in school routines. On the other hand, the instruments must correspond to the current standards of psychological tests, so that the results can be clearly interpreted.

Depending on the domain of use, CBM may refer to separate competencies that are curricularly identified for the area (e.g., CBM for addition tasks in the numerical range up to 20) or that can be regarded as an indicator of general outcome (e.g., reading aloud as an indicator of general reading skills). Alternatively, they may bundle different partial competences relevant to the domain in a single instrument (CBM with mixed tasks for calculating sizes, for factual tasks, etc.) [37,40–43].

The origin of CBM research lies in the field of reading. Accordingly, many methods have been published in this domain [43]. Reading fluency is often assessed by reading aloud individual syllables, words, or texts [44]. The working time is limited to one minute. The test leader documents the correctly read syllables or words.

A large number of research findings show, in particular, that measures of fluency are relevant with regard to students' reading skills [45–48]. According to Fuchs et al. [44] and Reschly, Busch, Betts, Deno, and Long [49], oral reading fluency can be assumed to be a reliable indicator of overall reading competence.

While much attention has been paid to oral reading, there is a lack of research related to the silent reading of students [35,50]. One justification for this can be found in the conclusions of the National Reading Panel [16]. Accordingly, there is a lack of empirical research on the effectiveness of silent reading experiences [51]. Therefore, adequate time should rather be given to reading aloud in class [51–53]. In reality, however, silent reading is the most important form of reading from the first

grade onwards [50]. Empirical findings indicate that there is a high correlation between oral reading and silent reading. This is particularly true for gifted readers and in higher grades [53–55].

#### **4. Research Questions**

Our research refers to the word recognition skills of elementary school students. In order to early identify struggling elementary school students, we want to generate CBM to assess their word recognition skills. To create different CBM instruments, we designed an item pool, from which items can be flexibly selected according to content-related but also psychometric aspects. The aim of the study presented here is to test the psychometric suitability of the item pool.

#### **5. Methods**

The psychometric suitability of the items from the item pool were tested using common item parameters (item difficulty, selectivity, and fit to the one-dimensional Rasch model). In addition, the coefficients of reliability and validity were determined.

##### *5.1. Design*

The items of the generated item pool were distributed and piloted within a multimatrix design [56]. Items were divided by grade level into eight different word lists each. Due to the multimatrix design, each list had a proportion of identical words (so-called anchor items) within one grade level and between grade levels. The tests were carried out by the teacher in the middle of the school year without a time limit, as is usually the case with CBM, in order to be able to calculate characteristic values for each item.

The multimatrix design of the test templates made it possible to generate a cross-linked data set. Analyses based on the item response theory (IRT) allowed the determination of psychometric parameters for all items based on the total sample. Since the present data matrix shows a binary coding in “correctly solved” or “incorrectly solved”, a dichotomous Rasch Model was estimated. The Rasch analyses were performed with the statistics program R [57] using the pairwise package [58]. The model fit of the items was judged by their estimated Infit values. Since the outfit statistics are clearly influenced by outlier values, whereas the Infit values are more sensitive in the range of medium ability values [59], the Infit statistics were primarily examined in the present study for deviations from the expected value 1 ( $0.70 \leq \text{Infit} \leq 1.30$ ) [60]. For further analysis of the quality of the items, common item statistics (difficulty and selectivity) were calculated.

In order to check for differences in item difficulties between boys and girls (test fairness regarding gender), a graphical model test was carried out to assess the measurement invariance of the items.

To analyze the reliability, Cronbach’s  $\alpha$  was reported. Based on a correlation of the items of the item pool with an external criterion (ELFE-II test), the construct validity could be tested.

##### *5.2. Sample*

A total of 4268 elementary school students took part in the evaluation of the item pool. Table 1 gives an overview of the distribution of the children among the different grades. One part of these children ( $N = 178$ ) solved the tasks of the item pool as well as a German reading comprehension test (“Ein Leseverständnistest für Erst- bis Siebtklässler—Version II”, ELFE II; see below).

**Table 1.** Descriptive statistics of the pilotage sample.

Grade	Curriculum-Based Measurements (CBM)			ELFE II		
	N <sub>Students</sub> (N <sub>Classes</sub> )	Mean Age	Percentage of Girls	Item Pool Items Correct Mean (Standard Deviation)	N	Mean (SD)
1	1110 (58)	6;9 (0;5)	55.7%	13.14 (11.14)	48	28.69 (12.01)
2	1091 (58)	7;9 (0;5)	49.2%	39.98 (12.50)	46	57.54 (18.09)
3	1066 (57)	8;9 (0;7)	52.6%	46.52 (10.96)	39	71.38 (20.16)
4	1001 (50)	9;9 (0;6)	49.9%	48.81 (7.02)	45	107.02 (27.43)

### 5.3. Instruments

#### 5.3.1. The Item Pool

Against the theoretical background mentioned before, items for assessing word recognition skills were developed and compiled into a comprehensive item pool. In order to form a suitable item pool for assessing the word reading skills of children of primary school age, various considerations are necessary, which integrate verbal, literary, scientific, and curricular analyses. The formal design of the items was based on economic and pragmatic factors. Thus, they were to be feasible as group procedures in class. In connection with the previously described significance of silent reading experiences [35,50,51], it was therefore decided that the students should identify a real target word from a selection of pseudowords (e.g., “Maerl”–“Maler”–“Melar”–“Mlaer”; target word: “Maler” = painter).

To generate the item corpus used in this study, an analysis of various common textbooks was carried out. An intersection of the word material was created and compared with the available minimum vocabulary for the primary school sector in Germany. On this basis, 1277 words could be identified as relevant word material for primary schools. The words of the item pool were structured according to different aspects (word type, number of letters, number of syllables, and number of graphemes, as well as phonological, morphological, and orthographic peculiarities) and occurrences according to grade levels. For each word out of the item pool we designed pseudowords. Every distractor shows an optical proximity to the target word. For each item, pseudowords have been chosen that have a letter combination valid for Germany, as well as those that are unpronounceable in the German language.

Within the prepilot, a total of 533 children of the first to the fourth grade solved between 40 and 50 items according to the described task format, depending on the grade level. The distribution among the different grades is shown in Table 2.

**Table 2.** Descriptive statistics of the sample in the prepilot.

Grade	N <sub>Students</sub> (N <sub>Classes</sub> )	Mean Age	Percentage of Girls
1	147 (7)	6;5 (0;5)	46.3%
2	140 (7)	7;6 (0;6)	47.9%
3	109 (5)	8;5 (0;6)	51.4%
4	137 (6)	9;5 (0;6)	37.2%

An analysis of the student outcomes (frequency of solutions) and interviews with the teachers and students (difficulty with tasks and possible remarks) indicate that the task format is understandable for students in elementary schools, that teachers consider it appropriate, and that there is a high variance of outcomes, i.e., it can differentiate between different achievement levels.



### 5.3.2. The ELFE-II Test

In addition to the items of the item pool, some of the children worked on an established instrument to assess the reading fluency, reading accuracy, and reading comprehension of German-speaking children at the word, sentence, and text level (ELFE-II) [61]. To test the reading comprehension at the word level, the children had to choose the correct word out of a list of four for a given picture within a limited time span. At the sentence level, the children had to separate the correct word from four given distractors, and at the text level, the children were asked to answer multiple-choice questions for short texts. The ELFE-II test can be used in an individual or group session from the end of the first grade to the beginning of the seventh grade. The reliability (split-half reliability:  $r_{tt} = 96$ ; retest reliability:  $r_{tt} = 93$ ; parallel reliability:  $r_{tt} = 93$ ) and concurrent validity (correlation to another reading test:  $r = 77$ ; correlation to the teacher's judgment:  $r = 70$ ) of the instrument could be proven. Construct validity was determined using structural equation models. In addition, validity studies are available for children with diagnosed reading and spelling disorders and for children from different school types [61].

## 6. Results

Due to the scaling according to IRT, empirical characteristic values (difficulty, selectivity, and model fit statistics) considered during item selection are available for each item. The item difficulties  $\sigma$  result from the Thurston threshold values estimated in the Rasch Model (due to dichotomous response possibilities). The  $\sigma$ -values can be interpreted as z-values, so that a value of zero corresponds to an average difficulty. Values below zero indicate that the words were easier for the children to read, values above zero indicate more difficult items. The selectivity values were calculated as point biserial correlations of the raw scores with the respective total value of the test template. These values help to discriminate which items are separated between students with low and high levels of performance. A value close to one means that the item assesses the same aspect as the overall test. A value close to zero indicates that an item has little in common with the overall test. In this study a value of  $r_{pbis} = 0.2$  and above served as a minimum criterion.

Of the items analyzed, 206 showed too little selectivity ( $r_{pbis} < 0.2$ ) or an under or overfit in the Infit statistics ( $fit < 0.70$  or  $fit > 1.30$ ). These items were eliminated from the item pool for further analysis. The reduced item pool was then scaled again using a one-dimensional Rasch Model. The selectivity values were at least  $r_{pbis} = 0.20$ , the maximum was  $r_{pbis} = 0.66$ , and the average value was  $r_{pbis} = 0.41$ . The item fit statistics (Infit<sub>MnSq</sub>) varied between min = 0.70 and max = 1.30. The mean Infit<sub>MnSq</sub> was 0.92. This indicates that there were no model violations and that all items meet the requirements of a one-dimensional Rasch model. All items thus form a one-dimensional scale, i.e., they measure the same construct.

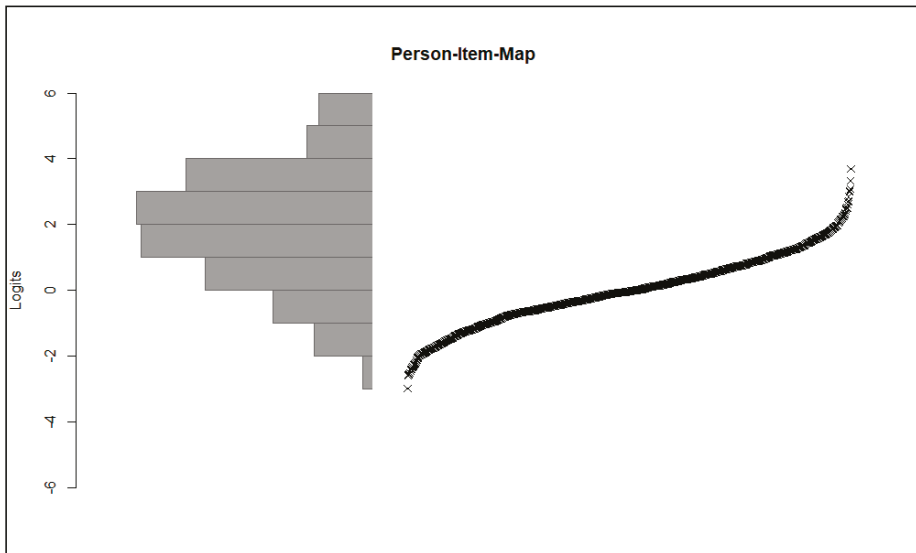
The mean item difficulty was  $\sigma = 0.00$ , and the values scattered in a range between min = -2.99 and max = 3.68. The item pool thus covered a range of very easy to very difficult items. An analysis of the item difficulties separated by grade levels showed an increase in the mean values with constant standard deviation (see Table 3), i.e., the items became easier with the increasing grade level. Results show that there is a wide range of item difficulties in every grade level.

**Table 3.** Mean, minimum, and maximum item difficulties, separated according to grade levels.

Grade	Mean	SD	Min	Max
1	-0.61	0.76	-2.99	1.39
2	-0.49	0.98	-2.60	2.84
3	0.27	0.95	-2.41	3.08
4	0.70	1.02	-2.57	3.68

Due to the use of the Rasch model, it was also possible to map the item and person parameters on the same scale. The personal parameters WLE (Weighted-Maximum-Likelihood-Method) [62] were determined by a pairwise item comparison [63,64]. This method is particularly suitable for data sets

with missing values [64,65]. The WLE can be used to assess the appropriateness of the degree of difficulty of the items. The person item map (see Figure 1) shows the person parameters as histograms, as well as the item difficulty. It becomes clear that the measurement range of the items essentially corresponds to the distribution of the person parameters. However, one can see that there is a lack of items for students with particularly high skills.

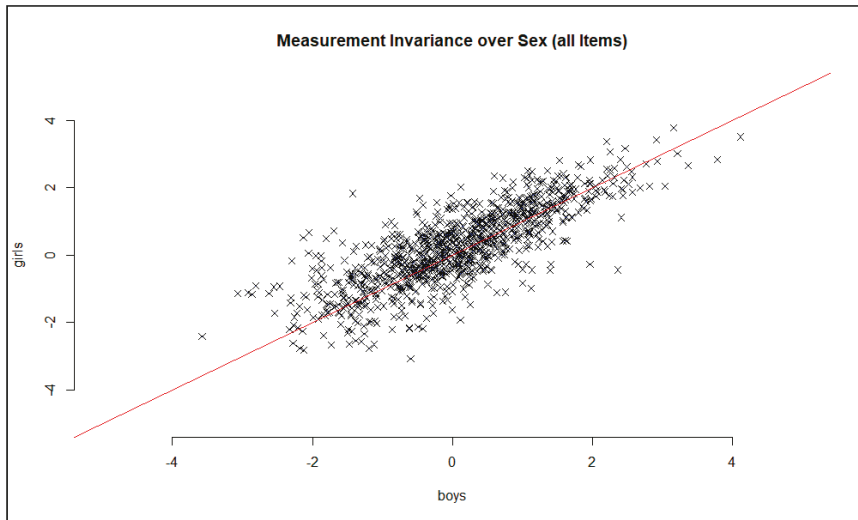


**Figure 1.** A person–item map (distribution of a person’s abilities as a histogram on the left side; measuring range of the items ordered by item difficulty).

In order to analyze the differences in item difficulties between boys and girls, the results obtained were plotted separately by gender on the  $x$ - and  $y$ -axes (see Figure 2). If the parameters are constant across the sexes, they run along the bisectors of the angle. Here, there are differences in the item difficulties of individual items. A few items ( $N = 21$ ) showed very large deviations from the bisecting line. A variance analysis showed a significant influence of sex ( $F(1, 4115) = 9.753, p < 05$ ), but the effect was only small ( $\eta^2 = 002$  or  $d = 0.10$ ).

For the eight word lists from each grade level, we determined Cronbach’s  $\alpha$ . The overall values varied between  $\alpha = 74$  and  $\alpha = 97$ . On average, the values were high (grade 1:  $\alpha = 95$ ; grade 2:  $\alpha = 89$ ; grade 3:  $\alpha = 89$ ; and grade 4:  $\alpha = 85$ ).

According to Cohen [66], the correlation with the ELFE-II test is high:  $r = 64$  ( $N = 178$ ).



**Figure 2.** Graphical model test for the assessment of the measurement invariance via gender. Note: a few items cannot be displayed here, as they show very large deviations from the bisecting line.

## 7. Discussion

The aim of the present study was to design an item pool to assess the word recognition skills of elementary school students. The importance of word recognition in the context of reading fluency was established. Overall, word recognition can be seen as a potential indicator for first reading skills [12,13]. To increase the assessment economy in school practice, the items were conceived as tasks for quiet reading. This enables an assessment of the whole class at a time. It is assumed that these results are largely related to oral reading skills [53,54].

Another aim of the study was to verify the psychometric suitability of these items. For this purpose, the items were distributed over different test templates, which were connected to each other by means of anchor items. Thus, not every child in the sample had to process all the items, but it was still possible to determine item and person estimators for each item and for all students using the item response theory. From the original 1277 items, a total of 1071 items corresponded to the previously set criteria. The other items were dropped due to unfavorable selectivity or an over- or underfit to the computed Rasch model. Overall, the reliability of the individual test templates is high (lowest average  $\alpha = 85$ ), which speaks for the homogeneity of the items. The correlation with other reading tests is also high ( $r = 64$ ). This shows that word recognition skills are related to reading speed and reading comprehension.

Although there are indications that some of the items are of different difficulty for girls and boys (in the sense of test fairness), these differences can be regarded as minor. No items measure in the upper performance range, which is another limitation of this study. However, it can be argued that although word recognition is highly correlated with other reading skills, such as passage comprehension throughout primary school [47], it is particularly important in the first years of primary school [34]. From the third grade onwards, it can be assumed that students have largely acquired word recognition skills [35,36]. In this respect, possible ceiling effects are to be expected in higher grades. The items of the item pool therefore differentiate particularly in the lower performance range. Against this background, however, they can be used for screening purposes. Overall, the targeting of the items appears to be adequate. Though word recognition skills seem to be a potential indicator of reading skills, they are not sufficient to diagnose higher reading skills. The use of further test instruments should be considered here.

Based on the item pool, CBM with parallel forms of the same structure were developed, which can be used every four weeks during a school year (10 parallel forms in each grade level). A proportion of easier ( $-2.5 \leq \sigma < -1$ ), medium ( $-1 \leq \sigma < 0$ ), and more difficult items ( $0 \leq \sigma \leq 1$ ) was selected to map different areas of competence. In further investigations, the suitability of the developed CBM for progress monitoring will be investigated. In addition to classical quality criteria (objectivity, reliability, and validity), progress monitoring criteria must also be fulfilled (Fuchs, 2004). The study presented here only uses results from a cross-sectional study. Thus, no information can be derived on the suitability of the items for status diagnostic purposes. The scaling according to the item response theory, however, is to be seen as a meaningful addition to the classical test theory, which allows first statements about the suitability for progress monitoring (high reliability, unidimensionality of the measured construct, constant item difficulty, and high test fairness) [67–69]. In a further step, the measurement invariance over different test times should be investigated. In addition, the sensitivity to change as well as the applicability and effectiveness in the school context should be examined [42].

A calibrated item pool, as described in this study, provides many advantages. Different instruments can be flexibly developed from such a pool. It is also possible to realize adaptive test situations, whereby the item selection in the concrete test situation is dependent on the ability of the child, in order to enable more precise measurements at the ability level. In this context, the use of digital media appears to be particularly useful [35,70]. In addition, the time taken to process the items can be measured with the aid of a computer. This makes it possible to dispense with a time restriction on the processing time, which can lead to increased pressure on the students. A further advantage is the possible combination of diagnostic information and training material. Computer-aided training programs can react adaptively to the results of an upstream diagnosis. Digital technologies offer the potential to support struggling readers; however, little systematic research has focused on the effect of technology on reading skills [71]. In terms of quiet reading, the research situation has so far been even sparser.

Future research will concentrate on factors that influence the difficulty of the items of the word pool. Possible variables in this context are structural features of the words (word type, word length, number of syllables or graphemes in a word) and phonological, morphological, and orthographic characteristics and occurrences in textbooks according to grade level.

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Article

# Testing the KAPS Model of Reading Comprehension in a Turkish Elementary School Context from Low Socioeconomic Background

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**Abstract:** This correlational study aimed to explore the relations of background knowledge, automaticity (rate), prosody, and strategy use with reading comprehension (KAPS model of reading comprehension) in the written Turkish language context with 207 fourth grade students. Successful comprehension requires readers to make meaning out of what they read. Our KAPS model of reading comprehension hypothesizes relations of background knowledge, fluency components (rate and prosody), and strategy use with reading comprehension components (literal and deep) in the Turkish language and addresses the direct effects of these predictors on the reading comprehension of fourth grade students. The results showed that, whereas fluency and strategy use made statistically significant contributions to reading comprehension, background knowledge did not. Based on the results, the study affirms the importance of automaticity in word recognition, prosody, and comprehension strategies in contributing to reading comprehension in Turkish and, as such, should be given priority for literacy instruction in Turkish.

**Keywords:** reading comprehension; KAPS model; comprehension strategy use; reading fluency; background knowledge

## 1. Introduction

Reading comprehension, in any language, is the cognitive process of simultaneously extracting and constructing meaning through interaction and involvement with written texts [1–3]. Reading comprehension is often viewed as a binary capability involving literal and inferential comprehension outcomes. While literal comprehension is related to readers retrieving explicit information directly from a text [4,5], inferential comprehension involves the readers' consideration of content beyond the text and requires readers to integrate their perspectives with that of the text author. As such, inferential comprehension is theorized to be the result of analyzing and synthesizing knowledge from different sources [5–7].

Beyond the two levels of comprehension, reading comprehension is a complex process that is affected by a variety of cognitive factors, such as reading fluency, purposes for reading, usage of comprehension strategies, vocabulary knowledge, and background knowledge. Additional contributors to comprehension include readers' knowledge of printed language structure and language conventions through which information is conveyed [1,8–11].

Fluency is the ability to read text accurately, automatically (at the speed of oral language), and with prosody. Fluency has been described as the bridge between word recognition and comprehension in



that fluency, or automatic reading, frees up cognitive resources from word decoding to processing meaning [12]. Readers who attain automaticity in decoding, have sufficient prior knowledge, and are proficient in other contributing processes of comprehension are able to make meaning from the text with relative ease [13]. Scientific studies have demonstrated consistent and positive relationships between reading fluency and comprehension [14–19].

The awareness of the importance of prior knowledge for reading comprehension is critical. Before synthesizing and analyzing new information, previous experiences or background knowledge need to be connected to and integrated with the new information in a text. In every new meeting with the text, the reader brings her/his total previous experiences to make meaning from the text [20]. Research has shown that comprehension is enhanced when readers activate and use prior knowledge to make connections with the text when reading [21,22].

Skilled readers also employ a variety of comprehension strategies and competencies to comprehend text [23]. Reading comprehension-related strategies include activating background knowledge, summarizing, identifying main idea, awareness of text structure, predicting, and self-questioning [24]. These reading competencies support the reader in gaining and constructing meaning from text [8]. Previous research in reading English has focused on the competencies and strategies employed by proficient readers when reading. Mariotti, for example, [10] articulates that strong vocabulary, use of strategies, reading fluency, and prior knowledge are underlying factors of proficient reading comprehension. When readers activate their prior knowledge and make connections to prior knowledge, and with the use strategies, they can comprehend better what they read [25,26].

The role and importance of comprehension-related strategies in Turkish, and with the students manifesting reading difficulties, however, are less well understood [27–32].

Previous research in Turkey has explored the relationship between prior knowledge and other comprehension strategies and competencies. Akyel and Ercetin [33] investigated the relationship between the sufficiency of prior knowledge and use of comprehension strategies such as questioning, creating mental images, summarizing, and making predictions. Greater prior knowledge resulted in more use of comprehension strategies. Other research has shown a strong relationship between vocabulary and reading fluency [34]. Additionally, Beydogan [35] noted positive and significant relationships between strategy use and reading fluency. In another study, Ates and Yildirim [34] investigated the extent to which practices related to reading instruction and strategy are used in classroom settings. The findings revealed that elementary classroom teachers do not employ strategies to improve students' reading comprehension and do not teach strategies to students explicitly.

In this study we attempted to expand our understanding of the relationship between the various comprehension factors and reading comprehension for Turkish elementary students. It focused on the relationships and interactions between background knowledge (K), reading fluency (both automaticity (A) in word recognition and prosody (P)), comprehension strategy (S) employment, and reading comprehension. We hypothesize that these various factors together contribute to students' reading comprehension in a theoretical model we termed KAPS.

In the current study, we attempted to test the KAPS model in a Turkish language context. There were two main research questions, as follows:

1. Does the KAPS model adequately represent reading in the Turkish language?
2. What components of the KAPS model show relationships with reading comprehension?

## **2. Methods**

### *2.1. Research Design*

This research is a correlational study where we sought to understand what kind of relations reading fluency, background knowledge, and strategy use have with reading comprehension. Through this design, we aimed to clarify the hypothesized the KAPS model of reading comprehension in a Turkish. Therefore, structural equation modeling (SEM) was employed for the analysis. The reason

why we used SEM is that structural equation modeling, which is a statistical technique, is used to measure underlying hypothetical constructs and their interrelationships.

## *2.2. Participants*

The purpose of the study was to explore the relationships of background knowledge, reading fluency, and strategy use with reading comprehension in Turkish elementary-grade students. A total of 207 fourth graders from five different classes in the same school were enrolled in the study. The research took place in fall and spring semesters, 2016, in Turkey's Denizli province. The participants were willing and available to take part and informed consent letters were obtained from all of the participants and all parents or guardians. The subjects were relatively homogenous, of middle socioeconomic (SES) status, and ranged in age from 9 through 10 years. Seventy-eight girls and 119 boys who participated in the study were not identified as learning disabled and their reading development was felt to be within grade level expectations according to their classroom teachers and the school counselor. All of the students were considered typically developing readers by their teachers.

## *2.3. Materials and Methods*

### *2.3.1. Texts*

The students read an expository text that consisted of 338 words. Assessments of literal and deep comprehension, background knowledge, and fluency (both automaticity and prosody) were based on students' reading of this text. The text, which was about cartoons, was obtained from a grade appropriate Turkish language arts course textbook. The text explained the nature of cartoons, their historical development, types of cartoons, and the role of cartoons in communication. The other short passages for assessing strategy use were obtained from the same fourth grade textbook and were either reorganized or shortened for the reading strategies.

### *2.3.2. Reading Fluency*

Reading fluency, including word recognition automaticity and prosody, was assessed using the expository text. Automaticity was determined by calculating the number of words read correctly in the initial 60 seconds of oral reading. Prosody was assessed qualitatively by a researcher who listened to each student read the grade-level passage and rated the prosodic quality of the oral reading using a rubric that describes levels of competency on various elements of prosody (expression/volume, phrasing, smoothness, and pace). The rubric was developed by Rasinski [36] and adapted by Yildiz, Yildirim, Ates, and Cetinkaya [37] for use with Turkish students. Prior research using the rubric with English readers has demonstrated the rubric to be a reliable and valid measure of prosody [38,39]. The Turkish adaptation of the scale included the same four main dimensions in previous studies [36]. Students' scores for the full prosody assessment ranged from a minimum of 4 and a maximum of 16.

### *2.3.3. Background Knowledge*

The researchers developed a 10-item, multiple-choice test to assess the students' background knowledge about cartoons, the content in the main text. The researchers examined the text to identify content (knowledge) that was judged to be essential for correctly answering the questions. Distractors in the background knowledge test included either facts that were presented in the text or events that were judged to be familiar from participants' everyday experiences but not consistent with the information presented in the text. The test-retest reliability of the prior knowledge measure was computed, with 3 weeks between the test and the retest. A The reliability estimate was determined to be (Pearson  $r$ ) 0.81 (see Appendix A).

#### 2.3.4. Reading Comprehension Strategies

Strategy use was determined using a 12-item, researcher-developed measure that was based on work by Kozminsky and Kozminsky [40] and was also similar to the measures employed in previous research [41,42]. Short passages, appropriate for fourth grade, were identified from fourth grade Turkish language arts textbooks. After reading each passage, the students answered two multiple-choice items that required the use of various reading comprehension strategies. For example, for the strategy of summarizing, students read a passage and were presented with four possible summary sentences. Their task was to choose the best summary of the passage. Based on the findings from previous research relevant to strategy instruction, we identified and assessed six strategies: activating background knowledge, summarizing, identifying main idea, awareness of text structure, predicting, and self-questioning (see Appendix B).

#### 2.3.5. Reading Comprehension

Following previous research [43], we developed a sentence verification task (SVT) to measure the students' literal comprehension of the main text (Cronbach's Alpha = 0.71). The SVT was developed by generating four types of test items from sentences in the text/s: (a) originals, which were copies of sentences that appeared in the text/s; (b) paraphrases, which were constructed by changing as many words as possible in original sentences without altering the essential meaning; (c) meaning changes, which were constructed by changing one or two words in original sentences so that the meaning of the sentences was altered; and (d) distractors, which were syntactically similar and thematically related to the original sentences but were not consistent with the meaning to the originals. The test consisted of 16 items (four originals, four paraphrases, four meaning changes, and four distractors) that the participants were asked to mark "yes" for items that had the same meaning as text sentences (originals or paraphrases) or "no" for those that had a different meaning (meaning changes and distractors).

Again, following Royer et al. [43] and Strømsø, Bråten, and Samuelstuen [44], we constructed an inference verification task (IVT) to measure the students' deeper or inferential, understanding of the same text (Cronbach's Alpha = 0.67). This test consisted of 16 items, 8 of which were near inference items and 8 of which were far inference items. The near inference items were constructed by combining information in the text to form either a valid or invalid inference. The far inference items were constructed by combining an item of information from the text with information that the student would likely have about the topic in order to create valid or invalid inference. The students were instructed to mark "yes" for the items that could be inferred from material presented in the text, and "no" for those that could not be inferred from material presented in the text (see Appendix C).

#### 2.4. Procedure

Prior to the study, the main text, short passages and accompanying questions were reviewed by experts in reading education from a public university in Turkey. All reviewers had Ph.D. degrees in elementary school education. The experts reviewed the extent to which the texts adequately corresponded to reading domain objectives of the fourth grade Turkish language arts curriculum and the extent to which the questions adequately measured comprehension of the texts. The experts also verified that each comprehension question was appropriate given developmental standards and the students' reading levels.

Students initially completed the multiple-choice background knowledge test. Next, they were asked to read the grade-appropriate expository text on cartoons and complete the SVT and IVT tests. Students were tested individually and asked to orally read the passage corresponding to their grade level placement. The students were asked to read the text in their best or most expressive (prosodic) voice and were told that they would be questioned about what they had read following their reading. During each student's oral reading, the researcher administering the test marked any uncorrected word recognition errors made by the student as well as marking the text position of the student at the end of

60 seconds in order to determine reading rate, a measure of word recognition automaticity. Prosody, or expressive reading, the second element of fluency, was measured by independent evaluators listening to the student reading and then rating the prosodic quality of the oral reading using the Turkish adaptation of the multi-dimensional fluency rubric [45].

### 3. Results

The data obtained from the students' readings included measures of literal and inferential comprehension, word recognition automaticity (words read correctly per minute), prosody (qualitative rating of expressiveness using the multi-dimensional fluency scale), background knowledge, and strategy employment. Means and standard deviations for the six variables are presented in Table 1.

**Table 1.** Mean and standard deviations for the variables including comprehension and fluency components, strategy, and background knowledge.

Grade		N	M	SD
4	Literal Comprehension	207	10.22	2.03
	Deep Comprehension	207	10.13	2.06
	Prosody	207	12.50	2.94
	Rate	207	82.10	18.39
	Strategy	207	6.70	2.50
	Background Knowledge	207	3.97	1.55

The relationship between the comprehension related factors and comprehension itself, was determined by calculating correlations between variables. The correlations are presented in Table 2; all correlations were found to be statistically significant and substantive.

**Table 2.** Correlations of fluency components, strategy, and background knowledge with comprehension components.

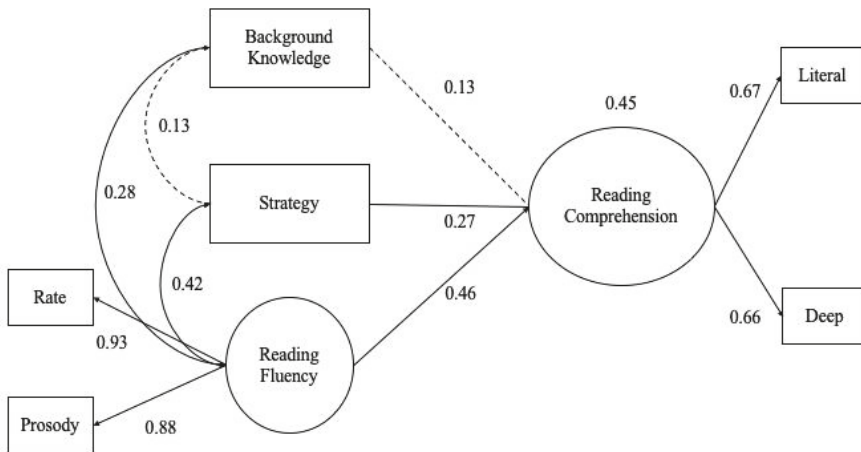
Grade		Literal Comprehension	Deep Comprehension
4	Rate	0.36 **	0.39 **
	Prosody	0.40 **	0.33 **
	Background	0.18 **	0.21 **
	Strategy	0.34 **	0.31 **

Note: \*\*  $p < 0.01$ .

Given the positive and significant correlations among the variables in Table 2, we ran a path analysis using AMOS and Mplus statistical modeling programs. By this analysis, we aimed to determine the relations among the variables in an integrated model of reading comprehension. Those results are presented in the path diagram in Figure 1.

In the path analysis model, fluency, comprehension strategies, and background knowledge were used to predict reading comprehension. The path analysis results revealed that RMSEA, SRMR, TLI, and CFI values were within expected ranges. The fit of the data, then, to the proposed path model was considered good. For the full sample, the model yielded good fit indices. When reviewing overall fit summary indices in the model, the  $\chi^2$  test yielded a value of 5.752, which was evaluated with 5 degrees of freedom, and had a corresponding  $p$ -value of 0.331. The  $\chi^2/df$  was 1.150. Additionally, the RMSA was 0.027. The TLI was 0.99 and CFI was 0.99. Moreover, SRMR was 0.0132. These fit measures suggest that all of the indices expressed in the path analysis were a good fit to the data [46,47]. In the model, fluency and comprehension strategies made statistically significant contributions to the prediction of reading comprehension ( $\beta = 0.46$ ,  $p < 0.001$  and  $\beta = 0.27$ ,  $p < 0.01$ , respectively). Background knowledge, however, did not make a statistically significant contribution to the prediction of reading comprehension ( $\beta = 0.13$ ,  $p > 0.05$ ). Overall, this model explained 45% of the variance in

reading comprehension. Having a relatively high R-squared value in these predictions indicates that this model works well in the Turkish language context.



**Figure 1.** The relations of strategy use, reading fluency, and background knowledge with reading comprehension. The single-headed arrows show standardized regression coefficients and direct effects in the path model. Double-headed arrows represent correlations (covariance). Dotted arrows show insignificant coefficients in the path model. \*\*\*  $p < 0.001$ .

#### 4. Discussion

In the current study, we aimed to explore the validity of the KAPS model in the Turkish language context with Turkish elementary students by determining the direct relationships between fluency, background knowledge, and strategy usage as they contribute to comprehension. All contributors to comprehension, except for background knowledge, were found to be components of the model for reading comprehension.

A successful comprehension process requires the reader to make meaning. Previous research has shown that comprehension requires readers to employ prior knowledge and integrate it into text processing [20]. Additionally, comprehension occurs when readers connect their prior knowledge to the text, make connections between different parts of the text, and make connections between known and unknown information [11]. While previous research has shown that there are profound positive relations between prior knowledge and reading comprehension [21,22,26], the results suggest that, in a more complex model of comprehension, there was no significant relationship between reading background knowledge and reading comprehension. Students' background did not contribute significantly to the prediction of reading comprehension in the path analysis model. This result was not consistent with the previous research findings. In as much as previous research has verified the importance of background knowledge, the lack of a significant contribution of this variable in the current study may have been due to the use of an assessment of background knowledge that insufficiently assessed students' knowledge. Future research of models of reading in Turkish need to consider more robust measures of students' background knowledge.

The other result of the present study suggests a strong relation between reading strategy use, fluency, and comprehension. Fluent and proficient readers know how to and when to use reading comprehension strategies when they read. In other words, fluent readers are able to effectively use reading strategies during reading. This enables them to monitor reading comprehension processes [48,49]. The students' scores of strategy use made statistically significant and substantial contributions to reading comprehension. This result was consistent with the previous research [10,31,50]. Mariotti [10] has found that vocabulary

and strategy use were significant components of reading comprehension. Moreover, Seipel et al. [31] reported that proficient readers are better in strategy use compared to poor readers. Additionally, Reed and Lynn [44] found that using comprehension strategies such as making inferences from the text to be read had significant effects on reading comprehension.

The results of this study affirm the significance of fluency (including both automaticity in word recognition and prosody) as a significant variable in proficient reading and reading comprehension [9,18,51–55] in Turkish fourth grade students. As such, continued instruction in reading fluency, automaticity, and prosody, for Turkish students beyond third grade is warranted. Additionally, instruction in the application of specific comprehension strategies can also be recommended. Comprehension is not a passive task, and the use of comprehension strategies ensures that readers will actively monitor and process meaning as they read. Thus, comprehension strategies, especially the ones tested in the present study, and reading fluency (automaticity and prosody) need to be given priority for literacy instruction for Turkish elementary students, at least through Grade 4, and perhaps beyond for struggling readers. In conclusion, while the current study could not validate the complete hypothesized KAPS model of reading comprehension in Turkish language, it adds to the accumulating evidence of the importance of reading fluency and comprehension strategies for proficient reading, especially among upper elementary school students.

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## Appendix A

### Sample Questions of Background Knowledge Test (Cartoon) (Multiple-Choice Task)

Q1. “It is the type of painting that exaggerates the topics it deals with to be funny or sarcastic.” Which of the following concepts is related to this definition?

- A) Poster
- B) Porte
- C) Table
- D) Cartoon

Q2. It is the transfer of emotions, thoughts, and information between individuals. Which of the following concepts is related to this definition?

- A) Communication
- B) Cartoon
- C) Picture
- D) Literature

Q3. Which of the following cannot be used for cartoons?

- A) Cartoons are used to make social and political criticism.
- B) Cartoons are one of the important ways to communicate.
- C) Cartoons are also used to entertain people and make them think.
- D) Cartoons are one of the least used ways of communication.

Q4. Which of the following is not about the process of communicating?

- A) There is a source and buyer in the communication process
- B) Gestures are used in communication.
- C) Communication is a group activity.
- D) Many techniques are used in communication other than written language.

**Appendix B**

Sample Items of Literal Reading Comprehension Test (Cartoon) (Sentence Verification Technique Task)

	Correct	Incorrect
The cartoon presents less interesting and weaker messages when compared to other art branches.		
It seems possible that the messages created by cartoonists would reach the next generations.		
Cartoonists can find opportunities to communicate with people with their drawings.		

**Appendix C**

Sample Items of Inferential Reading Comprehension Test (Cartoon) (Inference Verification Technique Task)

	Correct	Incorrect
The fact that animated films are watched by millions of people all over the world shows how important the messages given through the cartoon/drawing are in the communication process.		
Cartoon forms a common language for communication between people. Therefore, people from different nationalities can easily understand each other through cartoons.		
Cartoons are used only without writing in the process of creating effective communication.		

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