



Reading Fluency: A Bridge from Decoding to Comprehension



Research Brief

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Abstract

Reading fluency forms a bridge from decoding to comprehension (Rasinski, 2004). The purpose of this paper is to provide a practical review of research, theory, and instructional practice related to reading fluency. In this review paper, reading fluency is defined, along with a discussion of the necessary component skills. Research on the importance of fluency to reading outcomes, including performance on state tests, is summarized. Practical information on fluency assessment, instructional approaches shown to improve fluency, and interventions for students with poor reading fluency, is included in this review.

Reading Fluency: A Bridge from Decoding to Comprehension

What is Reading Fluency?

What does it mean to be a fluent reader? When reading aloud, fluent readers sound natural. Their reading is accurate, quick, and uses proper expression. In contrast, dysfluent readers may make many errors, their reading may be slow and laborious as they employ strategies to identify words, and their reading may lack expression, instead being monotone and unnatural sounding. Based on these observable differences, fluency of oral reading can be easily assessed within 60 seconds (Rasinski, 2004). Though most easily assessed orally, reading fluency is not solely an oral skill. *Reading fluency is defined as the ability to decode and comprehend text at the same time* (NICHD, 2000; Samuels, 2006). This definition of reading fluency has been expanded from earlier conceptualizations, which focused only on word recognition (Harris & Hodges, 1995) and those that focused solely on the components or indicators of fluency without attention to the larger concept of fluency.

Components/Foundational Skills of Reading Fluency

Reading fluency is comprised of three component skills, or fluency indicators:

- **accuracy** of word decoding,
- **automaticity** of word recognition, and
- **prosody** of oral text reading

Accuracy of decoding refers to the ability to correctly generate a phonological representation of each word, either because it is part of the reader's sight-word vocabulary or by use of a more effortful decoding strategy such as sounding out the word. Skills required for accuracy of decoding include: alphabetic principles, the ability to blend sounds, the ability to use cues to identify words in text, and a large sight-word vocabulary of high-frequency words (Torgesen & Hudson, 2006). Accurate decoding is a requirement for building the next component of reading fluency – automaticity.

Automaticity of word recognition refers to the ability to quickly recognize words automatically, with little cognitive effort or attention. Automaticity is gained through practice to the point where previously effortful tasks, such word decoding, become fast and effortless – freeing up cognitive resources for other tasks, such

as text comprehension. Automaticity requires quick and accurate identification of individual words as well as speed and fluidity in reading connected text (Torgesen & Hudson, 2006). Automaticity is a requirement for building the next component of reading fluency – prosody – as the automatic decoding of words frees up attentional resources required for prosody.

Prosody of oral text reading refers to naturalness of reading, or the ability to read with proper phrasing and expression, imbuing text with suitable volume, stress, pitch and intonation. Prosody is an indicator that the reader is actively constructing the meaning of a passage as they read (Torgesen & Hudson, 2006). Indeed, prosody may both serve as an indicator that a student is comprehending as they read and also aid comprehension (Rasinski, 2004).

Reading fluency is situational (Samuels, 2006; Topping, 2006). For example, though your reading of this article is fluent, the reading of some academic articles is likely to be fluent only for those with specific subject-matter expertise. Sources of variability in fluency within an individual include: readability level of the text (proportion of words that can be recognized automatically, by sight), the student's familiarity with the topic (sight-word vocabulary and ability to use context to aid word identification), and the priority the student gives to speed versus accuracy in the specific situation (Topping, 2006).

Sources of variability in fluency across students include: the size of a student's sight-word vocabulary, individual variations in processing speed of word recognition, speed of decoding processes for unknown words, ability to use context to aid word identification, ability and speed with which word meanings are retrieved, ability and speed with which overall meaning is constructed, and a student's relative priority of speed versus accuracy (Topping, 2006). Of the sources of variability across students, sight-word reading efficiency, a measure of both the size of readers' sight-word vocabulary and the speed with which individual words could be recognized, has the strongest relation with reading fluency for children in Grades 2 – 7 ($r_s .71-.89$; Torgesen, Rashotte, & Alexander, 2001).

The Automaticity Theory of Reading Fluency

LaBerge and Samuels (1974) developed the Automaticity Theory of reading. **Automaticity** is the ability to perform a complex task quickly, with few attentional resources. The Automaticity Theory of reading draws on a wealth of cognitive research showing that the brain has limited attentional capacity, and the ability to perform two complex tasks simultaneously requires at least one to have become automatic. Automaticity develops as the result of extended practice, wherein a complex task that once was slow and required a great deal of attentional resources gradually becomes automatic.

LaBerge and Samuels (1974) applied the concept of automaticity to the reading process. Fluent readers are able to simultaneously decode and comprehend text. Given that both decoding and comprehension are difficult tasks, at least one task must be automatic in fluent readers. In beginning and struggling readers, the task of decoding uses most if not all attentional resources, allowing few resources for comprehension. Through extensive practice, readers become automatic decoders, able to quickly recognize a large lexicon of words. When decoding is automatic, attentional resources are available for comprehension, and metacognition

(active monitoring and regulation of one's own reading). Decoding has a reciprocal relation with comprehension; when reading in an area of expertise, comprehension can aid decoding.

To become automatic decoders, able to automatically generate a phonological representation of each word, readers must learn the distinctive features of letters and then of words. With practice, letters and then words become unitized -- seen as a holistic unit rather than a collection of features. Fluent readers have unitized high frequency words. Thus, to develop fluency readers require letter familiarity, phonemic awareness, and phonics, along with a vocabulary of high frequency words, knowledge of word parts and spelling patterns (rimes and phonographs), decoding strategies, and oral language skills (Ehri, 1995, 1998).

Importance of Reading Fluency

On the basis of scientifically-based research (for reviews see: Chard, Vaugh, & Tyler, 2002; Kuhn & Stahl, 2000; NICHD, 2000), No Child Left Behind, Reading First, and the National Reading Panel have all identified fluency as a critical component of an effective reading program (NCLB, 2001, NICHD, 2000). In a large study of a representative sample of fourth grade students, however, 44% could not fluently read grade-appropriate text (Pinnell et al., 1995). One in five students who failed a fourth-grade state reading test were automatic decoders yet had poor comprehension skills (Buly & Valencia, 2002). Moreover, students referred for supplementary reading instruction were most likely to show difficulty in fluency, compared to decoding or comprehension (Rasinski & Padak, 1998).

A key reason that fluency is viewed as a critical component of reading programs is that fluency is associated with reading outcomes, including comprehension. Pinnell et al. (1995) found that fluency was significantly associated with reading proficiency; more fluent readers scored higher on the NAEP reading assessment. Fuchs, Fuchs, and Maxwell (1998) also found a strong relation between fluency and comprehension ($r = .91$). Allington (1983) increased awareness of the importance of fluency in proficient reading, concluding that fluency instruction shows great promise for improving the performance of struggling readers.

Reading fluency is correlated with reading outcomes on state tests. Stage and Jacobsen (2001) found that fluency scores were correlated with fourth-grade reading scores on the Washington Assessment of Student Learning (WASL). McGlinchey and Hixon (2004) found that fluency scores were correlated with fourth-grade reading scores on the Michigan Educational Assessment Program (MEAP). In a large longitudinal study of students in Grades 3, 5, 7 and 8, Silbergliitt et al. (2006) found that fluency scores significantly predicted performance on the Minnesota Comprehensive Assessments – Reading (MCA-R; $r_s .50-.68$). Fluency was the dominant factor accounting for individual differences in reading comprehension on the FCAT, accounting for 56 % of variance in third-grade reading scores and remaining dominant in seventh grade. Thus, reading fluency robustly predicts performance on state reading tests across grades and states.

How to Assess Reading Fluency

Both the National Reading Panel (NICHD, 2000) and the National Research Council (Snow, Burns, & Griffin, 1998) recommend that teachers assess fluency regularly (NICHD, 2000). Fluency assessments need to cover the three component skills or indicators to provide a valid measure of fluency: *accuracy* of decoding, *automaticity/rate* of word recognition, and *prosody* of oral text reading. Rasinski (2004) outlines a quick assessment method that is easily administered and has been shown to be both reliable and valid: Curriculum-Based Measurement (CBM; Deno, 1985) also called Oral Reading Fluency (ORF). In CBM, the teacher listens to and/or tape-records the student reading a grade-level passage for one minute. The total number of words read, the number of uncorrected errors, and the number of words read correctly (WCPM) are recorded. Rasinski (2004) adapted CBM, such that all three component skills can be assessed from this one-minute recording and compared against target norms, provided by grade and time of testing.

- **Accuracy**, or percentage of words read correctly, is calculated as words correct divided by the total number of words read (WCPM/total).
- **Rate** is simply the number of words read correctly in one minute (WCPM).
- **Prosody** is assessed using a qualitative rubric, two of which are provided: the NAEP four-point rubric and the Zutell and Rasinski (1991) multidimensional fluency rubric.

Given the ease of administration and interpretation, these assessments can be repeated throughout the school year using different grade-level passages, meeting the recommendation for regular fluency assessment.

Alternative fluency assessment tools are available, including the Gray Oral Reading Test (Wiederholt & Bryant, 2003), a standardized test that assesses accuracy, rate, and comprehension. The Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminsky, 2002) is a widely used test of fluency, yet is criticized for measuring only the speed component of fluency, providing a potentially misleading and invalid measure (Allington, 2006; Pressley, et al., 2005; Samuels, 2006).

Instructional Approaches that Improve Reading Fluency

Reading fluency develops from practice. Rasinski (1989) provides a review of existing instructional approaches that have been shown to improve children's reading fluency, including: modeling fluent reading, practiced/repeated reading, assisted reading (i.e., listening to a tape while reading), and focusing on phrasing while reading. Two major instructional approaches have been proposed to increase reading fluency: repeated oral reading practice (with guidance and/or feedback) and independent silent reading practice. In 2000, the National Reading Panel reviewed the existing scientific evidence on the effectiveness of each of these instructional approaches.

Repeated Oral Reading. There is a wealth of evidence that repeated reading, in various forms, increases reading fluency. A meta-analysis (NICHD, 2000) showed that repeated oral reading practice has a significant positive effect on accuracy ($d = .55$), fluency ($d = .44$), and comprehension ($d = .35$). Samuels (1979) found

that repeated reading, performed to a criterion of 95 wpm, produced a significant increase in accuracy, automaticity, and prosody. Importantly, the practice generalized to new passages, with students requiring fewer readings to reach criterion. O'Shea, Sindelar, and O'Shea (1985) determined that students show the same fluency improvements after four repeated readings, rather than using a speed (wpm) criterion. Chomsky (1978) found that repeated reading, while simultaneously listening to an audiotape of the same text read by a fluent reader, increased students' fluency both on the practiced text and on new passages. Schreiber (1980, 1991) found that practice increased awareness of prosody, in addition to increasing students' fluency and comprehension. Downhower (1989, 1994) reviewed the available research on the efficacy of repeated reading in the primary and middle grades; repeated reading led to increased accuracy, automaticity, and comprehension of literal and higher-level meanings. Importantly, these improvements extended to unpracticed text. The National Reading Panel concluded that repeated reading had a significant positive impact on fluency and other reading outcomes in elementary school for both struggling and non-struggling readers. For struggling readers, repeated reading had a significant positive impact into high school (NICHD, 2000).

Independent Reading. The National Reading Panel (NICHD, 2000) stated that there was not sufficient evidence to conclude that independent reading increases fluency. In a response to the NRP, Samuels and Wu (2003) evaluated the effect of independent reading with third- and fifth-grade students over a period of six months. The experimental group read independently for 40 minutes per day, whereas the control group read independently for 15 minutes per day. There was an interaction between reading ability and time spent reading. Children with below-level reading ability did not show improvements with more time spent reading, whereas children with above-level reading did show improvement on the Standardized Test of Assessment of Reading (STAR), Metropolitan Achievement Test (MAT) vocabulary, and fluency (CBM) with more time spent reading, but not on the Woodcock-Johnson word recognition test. Thus, there is evidence that independent reading improves some components of fluency and level of reading achievement for higher-skilled students, but not for lower-skilled students.

Reading Fluency Interventions

Many students struggle with reading fluency, the ability to simultaneously decode and comprehend text. A large-scale study showed that just under half of students are not fluent readers (Pinnell et al., 1995). Students struggling with fluency, however, are not a homogenous group. Given the three component skills that are required for reading fluency: accuracy, automaticity, and prosody, students can fail to achieve fluency for multiple reasons.

Students can fail to develop accuracy, due to decoding problems. Students with dyslexia are especially at risk of failure at the accuracy stage. These struggling readers need interventions that build decoding skills, including letter familiarity, phonemic awareness, and phonics instruction, that will allow them to unitize their representations of letters and words (Ehri, 1995, 1998; Palumbo & Willcutt, 2006).

Students who fall behind can fail to develop automaticity even once accuracy has been achieved. Struggling readers have difficulty developing automaticity because there is a large gap between the sight-word vocabularies that they have developed and those of their normally-achieving peers. These struggling readers need interventions that increase the number of words that they are repeatedly exposed to, allowing them to expand their sight-word vocabularies and “close the gap” (Palumbo & Willcutt, 2006). English Language Learners (ELL) often struggle to build fluency due to lagging vocabularies. Interventions that increase word exposure as well as build word comprehension are helpful for ELL students and other students that have yet to build automaticity (Palumbo & Willcutt, 2006).

Students who have achieved automaticity may still struggle with prosody. Prosody is dependent on oral language skills that may be underdeveloped in some readers, especially ELL students who take 6-8 years to achieve the oral-skill level of their peers (Collier, 1987). Interventions that include the modeling of fluent reading along with practice and feedback are helpful for these students (Palumbo & Willcutt, 2006; Rasinski, 2004).

In summary, students may fail to achieve reading fluency for a variety of reasons. Early assessment and intervention is crucial given that the component skills of fluency build upon one another. Fluency assessments that provide specific information about accuracy, automaticity, and prosody levels can allow educators to identify where failures occur and to guide intervention strategies.

Conclusion

Reading fluency is the ability to decode and comprehend text simultaneously. Thus, reading fluency forms a bridge from decoding skills to comprehension (Rasinski, 2004). Fluency is comprised of three component skills or indicators: accuracy of decoding, automaticity of decoding, and prosody of oral text. Reading fluency is a crucial component of instructional reading programs and should be assessed regularly in the classroom. Quick and easy assessment of all components of reading fluency can be performed using a one-minute oral reading passage. Instructional and intervention approaches for improving reading fluency exist which have been scientifically evaluated for efficacy.

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