

The Efficacy of Repeated Reading and Wide Reading Practice for High School Students with Severe Reading Disabilities

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This experimental study was conducted to examine the efficacy of repeated reading and wide reading practice interventions for high school students with severe reading disabilities. Effects on comprehension, fluency, and word reading were evaluated. Participants were 96 students with reading disabilities in grades 9–12. Students were paired within classes and pairs were randomly assigned to one of three groups: repeated reading ($N = 33$), wide reading ($N = 34$), or typical instruction ($N = 29$). Intervention was provided daily for approximately 15–20 minutes for 10 weeks. Results indicated no overall statistically significant differences for any condition, with effect sizes ranging from $-.31$ to $.27$. Findings do not support either approach for severely impaired readers at the high school level. We hypothesize that these students require more intensive interventions that include direct and explicit instruction in word- and text-level skills as well as engaged reading practice with effective feedback.

Over the last decade, researchers and policy makers have focused their attention on the need to prevent reading disabilities in young children through early intervention. Considerably less attention has been provided to remediating reading difficulties at the secondary level. Despite recent initiatives such as the No Child Left Behind Act (2001), which emphasizes early intervention for reading difficulties, many students reach the upper grades still struggling to read effectively and efficiently and often fail to attain even the most functional levels of literacy even after participating in intensive multicomponent interventions (Denton, Wexler, Vaughn, & Bryan, 2008; Kamil et al., 2008). In the upper grades, these students are faced with keeping up with complex content at a challenging pace. Our educational system has expectations that all secondary-level students will be able to read words accurately and fluently and comprehend material with challenging content.

One important component of reading is fluency, the ability to read text with speed and accuracy; however, students with reading disabilities consistently struggle with this aspect of reading (Lyon & Moats, 1997; Meyer & Felton, 1999; Torgesen et al., 2001; Torgesen, Wagner, & Rashotte, 1997). There is a positive and significant relation between measures of fluency and comprehension for secondary-level stu-

dents, although this relationship is weaker than often reported for younger students (Denton et al., in review; Silberglitt, Burns, Madyun, & Lail, 2006). Although text reasoning may contribute substantially more to a student's success as he gets older and is faced with more challenging text (Schatschneider, 2004), a good reader must still be able to decode with automaticity to comprehend text (Chard, Ketterlin-Geller, Baker, Doabler, & Apichatabutra, 2009).

Fluency Interventions for Elementary-Aged Students with Reading Difficulties

Based on the observed relationship between fluency and comprehension, engaged reading practice designed to support the development of oral reading fluency (ORF) is often included in intervention approaches in the early grades (e.g., Chard, Vaughn, & Tyler, 2002; Denton, Fletcher, Anthony, & Francis, 2006; Mathes et al., 2005). There is empirical support for implementing repeated reading practice with elementary-aged children (Chard et al., 2002; Kuhn & Stahl, 2000; Meyer & Felton, 1999; National Reading Panel (NRP), 2000; Therrien, 2004; Wolf & Katzir-Cohen, 2001). The NRP (2000) reported that, in the area of fluency, repeated reading procedures can have a moderate impact on the reading ability of beginning readers.

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Fluency Interventions for Older Students with Reading Difficulties

Despite the need for effective interventions that will positively influence fluency outcomes, a recent synthesis of fluency interventions that included interventions for struggling readers in grades 6–12 from 1980 to 2005 found only 19 total studies, including only 6 empirical studies, indicating a dearth of knowledge regarding effective practices to increase struggling secondary school readers' ability to read fluently (Wexler, Vaughn, Edmonds, & Reutebuch, 2008). A majority of the fluency interventions included in the Wexler et al. (2008) synthesis can be characterized as repeated reading interventions in which students read the same text several times. The synthesis revealed that the repeated reading interventions that consistently improved reading rate outcomes included a previewing procedure such as listening to an audiotape or adult model of good reading before reading text or by providing corrective feedback such as having an adult or partner provide corrections while a student is reading. It is important to note, however, that although students made improvements in reading rate using these procedures, improvements did not necessarily generalize to word reading accuracy or comprehension. Moreover, improvements were often only observed on practiced passages. For older students who are faced with reading and comprehending a large amount of complex expository text, making improvements on practiced passages is not sufficient. Students must also be able to generalize improvements to unpracticed passages and participate in practices that will improve overall comprehension of text (Homan, Klesius, & Hite, 1993; Kuhn & Stahl, 2003; Rashotte & Torgeson, 1985).

Repeated Reading and Continuous Wide Reading

Although most fluency intervention studies have implemented repeated reading practices, an alternate approach to fluency intervention is based on the hypothesis that fluency and comprehension will improve through increased exposure to print resulting from opportunities to continuously read a wide variety of text with feedback. As in repeated reading, students engage in continuous reading practice; however, they read a long passage continuously or a range of materials without rereading. O'Connor, White, and Swanson (2007) noted that continuous reading provides just as much practice as repeated reading. In a study comparing repeated reading versus continuous reading with poor readers in second and fourth grade, O'Connor et al. (2007) found significant differences in fluency and reading comprehension for students in the treatment conditions over students in a nontreated comparison group. Results from two other studies that incorporated repeated reading practices and continuous reading practice demonstrated that reading text repeatedly may improve reading rate, but participants do not necessarily demonstrate gains in comprehension and word reading accuracy as those who read an equal amount of text nonrepetitively (Homan et al., 1993; Rashotte & Torgeson, 1985).

Possible benefits of continuously reading a variety of text as opposed to reading the same text repeatedly is that students may be exposed to different text structures, topics from a variety of content areas, and wider vocabulary. Additionally, continuous reading may be more motivating to students than repeatedly reading the same text.

Peer Pairing

Fluency interventions are often implemented in peer pairing formats such as partner reading or peer tutoring. The overall purpose of peer pairing is to increase the time students are engaged in reading and receiving immediate, corrective feedback (Mastropieri, Leinart, & Scruggs, 1999).

Peer tutoring is a widely accepted practice and has been found to be efficacious for students at various grade levels (McMaster, Fuchs, & Fuchs, 2006), but much of the research on this approach has been conducted in general education classes where the majority of students were average or above-average readers and the target students with learning disabilities had ample opportunities to have partners who could model fluent reading and provide helpful feedback (Fuchs, Fuchs, Mathes, & Simmons, 1997; Greenwood, Carta, & Hall, 1988).

Stenhoff and Lignugaris/Kraft (2007) conducted a review of peer tutoring interventions with students with mild disabilities in the upper grades. They found peer pairing to be an evidence-based practice and found several factors to positively affect outcomes (i.e., heterogeneous grouping, thorough training of partners, and incorporating monitoring procedures). Although this is a common grouping format used to implement fluency interventions such as repeated or nonrepetitive wide reading, less is known about the effectiveness of this practice with students who have serious reading difficulties (i.e., standard scores at least 1–2 standard deviations below the norm on standardized measures of reading).

Rationale and Purpose of the Study

Increasing automaticity by engaging students in repeated and nonrepetitive wide reading of text continues to be a widely implemented practice. A recently conducted synthesis by Chard et al. (2009), however, synthesized repeated reading interventions from 1975 to 2006 for students with learning disabilities and found only 11 single-subject and experimental and quasi-experimental studies that met criteria for being an "evidence-based" practice set forth by Gersten et al. (2005) and Horner et al. (2005). More rigorous evaluations of these types of fluency interventions, particularly with students with disabilities in peer pairing formats, are warranted.

This study was designed to contribute to the knowledge base related to effective interventions and intervention delivery practices for secondary school readers with significant reading disabilities. The study's purpose was to determine the effects of interventions implementing repeated reading and wide reading practices in a peer-pairing format on fluency,

comprehension, and word reading outcomes for students identified with disabilities who have significant reading difficulties. This study was designed to answer the following research question: What are the relative effects of repeated reading and wide reading practice on the reading fluency, comprehension, and word reading outcomes of high school students with severe reading disabilities?

METHOD

Teacher and Student Participants

The sample consisted of a total of 106 9th–12th grade students ranging in age from 13 to 17 years in a metropolitan area in the southwestern United States. Students were eligible for the study if they were enrolled in special education English and reading classes and were identified as having significant reading difficulties based on low scores (failing the reading portion of the Texas Assessment of Knowledge and Skills (TAKS) on the state reading test. Due to attrition, at the end of the study there were 96 students with pre- and posttest data. Therefore, the attrition rate was approximately 9 percent; however, there was no differential attrition across conditions. Permission to participate was obtained from parents and from the students.

Participants included students with learning disabilities (79 percent) and other students with significant reading disabilities. The sample also included a small number of students with emotional disabilities (3 percent), other health impairments (OHI) (8 percent), mental retardation (4 percent), autism (1 percent), and auditory impairment (1 percent). Table 1 presents the frequency of different exceptionalities by experimental condition.

TABLE 1
Exceptionality

Group Assignment		Frequency	Valid Percent
RR	LD	22	66.7
	ED	1	3.0
	OHI	5	15.2
	MR	2	6.1
	AI	1	3.0
	Unknown	2	6.1
	Total	33	100.0
WR	LD	28	82.4
	ED	2	5.9
	OHI	1	2.9
	MR	2	5.9
	AUTISM	1	2.9
	Total	34	100.0
C	LD	26	89.7
	OHI	2	6.9
	Unknown	1	3.4
	Total	29	100.0

Note: RR = Repeated Reading. WR = Wide Reading. C = Comparison. LD = Learning Disability. ED = Emotional Disturbance. OHI = Other Health Impaired. MR = Mental Retardation. AI = Auditory Impairment.

A description of treatment and comparison students by grade level, English as a Second Language (ESL) status, and gender is presented in Table 2. The majority of students in each group were 9th- or 11th-graders, with the largest grade grouping being 9th-graders (34 percent). Twelfth-graders were the least represented group with an overall total of 13 percent across all three groups. The Comparison group had the largest gender difference with 86 percent male and only 14 percent female. The ESL status was similar for all groups, with approximately 3–5 percent of students in each condition having been designated by the school as being students with ESL or an ESL/Limited English Proficiency (LEP) label. The majority of students in each treatment group were male (64 percent).

Procedures

The research question was addressed through an experimental pretest/posttest design with students randomly assigned to one of three conditions within each class. Students in 11 special education English and reading classes were paired within classes. Students were paired based on median pretest ORF scores with higher-level readers paired with lower-level readers. Given the variable, and relatively low, reading levels of participants, and the low number of students in each classroom, pairing was completed prior to randomization so that shared text would be appropriate for both partners. Once pairs were formed, each was randomly assigned to one of three conditions: repeated reading ($N = 33$), wide reading ($N = 34$), or the typical instruction comparison group ($N = 29$). Because partners in each pair participated in the treatment, serving as both tutor and tutee at different points, all students were administered a pretest and posttest and data were analyzed at the case level.

Intervention was delivered by three interventionists (two graduate research assistants and one full-time employee). During two 3-hour sessions, they were trained on the partner reading procedures and on intervention and monitoring procedures. Monitoring procedures included interventionists randomly observing pairs while they were engaged in partner reading to ensure students' fidelity to the procedures and accuracy of scoring and giving feedback. Interventionists met 100 percent fidelity of implementation criteria in role-play scenarios on each intervention before they implemented either intervention with students.

Description of Interventions

In the repeated reading condition, students read the same text three times each day. Each partner read the same text three times, exposing the pair to one text six times. Modeling for the lower-level reader was incorporated by having the higher-level reader read the passage first. Error correction from students' partners was incorporated into this condition as well as a summarization component. Students were explicitly taught how to provide immediate and corrective feedback during the week prior to implementing the intervention. Error correction consisted of each student reviewing missed words with their partner after their second read. For example, one student would say to his/her partner: "Here are the words I

TABLE 2
Demographic Information

	<i>Grade</i>				<i>ESL Status</i>			<i>Gender</i>	
	<i>9</i>	<i>10</i>	<i>11</i>	<i>12</i>	<i>No ESL</i>	<i>ESL/LEP</i>	<i>LEP</i>	<i>Female</i>	<i>Male</i>
RR (<i>N</i> = 33)	27.3% (<i>n</i> = 9)	24.2% (<i>n</i> = 8)	30.3% (<i>n</i> = 10)	18.2% (<i>n</i> = 6)	27.1% (<i>n</i> = 26)	3.1% (<i>n</i> = 3)	4.2% (<i>n</i> = 4)	42% (<i>n</i> = 14)	58% (<i>n</i> = 19)
WR (<i>N</i> = 34)	38.2% (<i>n</i> = 13)	23.5% (<i>n</i> = 8)	26.5% (<i>n</i> = 9)	11.8% (<i>n</i> = 4)	27.1% (<i>n</i> = 26)	5.2% (<i>n</i> = 5)	3.1% (<i>n</i> = 3)	41% (<i>n</i> = 14)	59% (<i>n</i> = 20)
C (<i>N</i> = 29)	37.9% (<i>n</i> = 11)	27.6% (<i>n</i> = 8)	27.6% (<i>n</i> = 8)	6.9% (<i>n</i> = 2)	26% (<i>n</i> = 25)	4.2% (<i>n</i> = 4)	0% (<i>n</i> = 0)	14% (<i>n</i> = 4)	86% (<i>n</i> = 25)
Total	34% (<i>n</i> = 33)	25% (<i>n</i> = 24)	28% (<i>n</i> = 27)	13% (<i>n</i> = 12)	80.2% (<i>n</i> = 77)	12.5% (<i>n</i> = 12)	7.3% (<i>n</i> = 7)	33% (<i>n</i> = 32)	67% (<i>n</i> = 64)

Note: RR = Repeated Reading. WR = Wide Reading. C = Comparison. ESL = English as a Second Language. LEP = Limited English Proficiency.

underlined. Let's read these together." Partners would then review all missed words. Summarization consisted of students providing their partners with a summarization of the text after the final read. As listeners, students were taught to use their finger or a pencil to follow along and underline errors. Students graphed the words read correct per minute from their final read each day.

In the wide reading condition, students participated in the same amount of daily engaged reading practice and followed procedures similar to those of the repeated reading students. The conditions differed in that students in the wide reading group did not read the same text more than one time. Each partner read three different texts one time each while his/her partner followed along, exposing the pair to six different texts. In this condition, error correction from partners and the summarization component was also included. Students in this condition graphed their "best read" each day. This represented the read in which the student read the most words correct per minute.

If the lower-level reader in a pair was able to read 100 correct words per minute with fewer than five errors for two consecutive sessions, the reading level for subsequent sessions was raised. The reading level was lowered if the lower-level reader in a pair made more than 2 errors in every 10 words.

An interventionist monitored pairs in each condition within each class by circling around the room and randomly monitoring pairs to ensure time on task. Students participated in the repeated reading and wide reading interventions for 15–20 minutes each day, five times per week for 10 weeks. Treatment students participated in an average of 12.2 hours of intervention.

The Comparison Condition

Students in the third condition served as a typical instruction "business as usual" comparison group. Students in this condition participated in the instruction they would normally receive from their classroom teachers during the same time and within the same classes as students in the treatment conditions. Based on observation and interviews with the teachers, the most prevalent activity/instruction in this condition involved practice for the reading portion of the state account-

ability test, the TAKS. Typically, this practice consisted of students reading and answering comprehension questions independently with minimal feedback.

Fidelity of Implementation

Each interventionist was observed by the first author three times using the same treatment fidelity checklist that was used for training purposes to determine the extent to which the interventions were implemented as planned. While the fidelity rating primarily included a check on the interventionists' implementation procedures, it also included an evaluation of the extent to which students were implementing the procedures with fidelity. In addition, interventionists collected fluency monitoring data in which they checked on the accuracy of each pair's fluency speed calculations at least once every other day. If the interventionist taught several classes, the first author (observer) rotated between the classes in which she recorded fidelity data. Treatment fidelity was calculated as the number of items correctly implemented divided by the total number of items on the checklist, multiplied by 100. Fidelity for interventionists ranged from 91 percent to 100 percent. In cases where fidelity was less than 100 percent, teachers were provided feedback to increase the chances of reaching 100 percent fidelity in subsequent sessions.

Materials

Reading material for the interventions was taken from three published fluency programs: The Six-Minute Solution (Adams & Brown, 2006), Read Naturally (Ihnot, 2003), and Quick Reads (Hiebert, 2006). Text from three programs was included so there would be an adequate amount of text for students at each reading level. Students alternated reading text from each fluency series. All passages were nonfiction and were selected to correspond with the reading level of the lower-level reader in a pair. Expository text was selected because it represents the most common type of text secondary struggling readers were asked to read and comprehend in their content area classes. Passages were approximately 175–450 words in length.

Measures

At pretest and posttest student performance was assessed in the reading domains of fluency, comprehension, and word identification using the following measures.

Fluency

ORF was assessed using standard reading assessment passages on the 8th-grade level, the closest level of ORF passages available to the students' actual grade level from the benchmark set of passages from the AIMSWeb system (Edformation, 2002). Students were given three passages on the 8th-grade level at pre- and posttest and the median score was used for analysis to obtain a more accurate measure of reading fluency. The ORF passages assess a child's accuracy and rate in connected text. Student performance is measured by having a student read a passage aloud for 1 minute. Errors are noted and the score is the number of words read correctly per minute. The AIMSWeb probes for grade 8 have reliabilities ranging from .77 to .95 (Howe & Shinn, 2002).

Students were administered the Test of Silent Contextual Reading Fluency (TOSCRF; Hammill, Wiederholt, & Allen, 2006). The TOSCRF is a group-based assessment of silent reading fluency that measures a student's essential contextual reading abilities (i.e., word identification, word meaning, sentence structure, comprehension, and fluency). Students are presented with short passages comprising rows of contextually related words, ordered by reading difficulty; all words are printed in uppercase without any spaces or punctuation between the words (e.g., AYELLOWBIRDPWITH-BLUEWINGS). Students are asked to draw a line between the boundaries of as many recognizable words as possible within 3 minutes (e.g., A/YELLOW/BIRD/WITH/BLUE/WINGS). The passages become gradually more complex in their content, vocabulary, and grammar (e.g., embedded phrases, sequenced adjectives, affixes, etc.). Reliabilities range from .82 to .87 for students ranging in age from 13 to 17.

Students were also assessed using the Test of Silent Reading Efficiency (TOSRE; Wagner et al., 2006). The TOSRE is a group-based assessment of silent reading fluency that measures a student's essential contextual reading abilities (i.e., word identification, word meaning, sentence structure, comprehension, and fluency). Students are presented with individual sentences, ordered by reading difficulty. The sentences become gradually more complex in their content, vocabulary, and grammar. Sentences range in length from 4 words to 10 words. Students read each sentence silently, then circle "yes" if the sentence is true or "no" if the sentence is not true. If the item is read correctly it can be completed using general background knowledge (e.g., A fish lives on land). Students complete as many items as possible within 3 minutes. To control for guessing, students' incorrect items were subtracted from the number of correct items. The manual is not available through the publisher for this measure and, therefore, reliability cannot be reported.

Comprehension

Students' comprehension achievement was assessed using the Woodcock-Johnson Tests of Achievement III (WJ III)

Passage Comprehension subtest. The WJ III is a nationally standardized individually administered battery of cognitive and achievement tests. The Passage Comprehension subtest is a measure of reading comprehension at the sentence level that uses a cloze procedure. The participants read a sentence or short passage and supply missing words based on the overall context. Reliability ranges from .87 to .97. Forms A and B were alternated at each assessment point.

Word Identification

Students' word identification achievement was tested using the WJ III Letter-Word Identification subtest. Reliability for the WJIII Word ID subtest is greater than .93.

Time-Series Data

In addition to the pre- and posttest assessment, each interventionist monitored students' progress in ORF through brief assessments administered biweekly using the ORF progress monitoring passages from the AIMSWeb system. At each administration, students were given one 8th-grade-level passage from the AIMSWeb system, the same series used at pre- and posttest. In addition, student progress was monitored using their daily practice scores graphed for students' third and final reading in the repeated reading condition and students' best score for each day's timed readings in the wide reading condition.

RESULTS

Descriptive statistics were calculated for all pretest measures for the treatment conditions and the typical practice comparison condition. Pre- and posttest standard score means and standard deviations are reported in Table 3 for the three groups for the WJ III Letter-Word Identification and Passage Comprehension subtests. Pre- and posttest raw score means

TABLE 3
Pretest and Posttest Means and Standard Deviations by Group

	<i>Pre M</i>	<i>SD</i>	<i>Post M</i>	<i>SD</i>
RR (<i>N</i> = 33)				
WJ-LWID	71.27	(17.32)	72.61	(15.49)
WJ-PC	68.39	(18.22)	71.88	(14.21)
TOSRE	12.63	(5.55)	13.86	(5.78)
WR (<i>N</i> = 34)				
WJ-LWID	70.97	(16.94)	71.70	(16.30)
WJ-PC	65.50	(19.18)	70.40	(14.98)
TOSRE	10.62	(5.73)	13.24	(6.70)
C (<i>N</i> = 29)				
WJ-LWID	73.97	(15.72)	73.48	(16.38)
WJ-PC	71.14	(20.58)	73.48	(18.04)
TOSRE	14.52	(7.26)	15.92	(7.42)
Total = 96				

Note: Standard scores provided for all measures except TOSRE, for which raw scores are provided; RR = Repeated Reading. WR = Wide Reading. C = Comparison. WJ-LWID = Woodcock Johnson III Letter-Word Identification. WJ III PC = Woodcock Johnson Passage Comprehension. TOSRE = Test of Sentence Reading Efficiency.

TABLE 4
Oral Reading Fluency Pretest and Posttest Means and Standard Deviations

	<i>Pre M</i>	<i>SD</i>	<i>Post M</i>	<i>SD</i>
RR (<i>N</i> = 33)				
AIMSWeb1	83.21	(42.92)	86.12	(40.25)
AIMSWeb2	80.33	(37.14)	82.67	(38.88)
AIMSWeb3	77.61	(38.92)	83.21	(39.38)
TOSCRF (<i>N</i> = 33)	75.18	(12.38)	77.67	(13.16)
WR (<i>N</i> = 34)				
AIMSWeb1	74.09	(35.64)	83.34	(38.93)
AIMSWeb2	73.29	(32.31)	76.48	(33.56)
AIMSWeb3	69.24	(29.83)	72.66	(31.92)
TOSCRF (<i>N</i> = 25)	68.81	(17.36)	73.56	(16.68)
C (<i>N</i> = 29)				
AIMSWeb1	83.79	(44.88)	91.62	(48.39)
AIMSWeb2	80.66	(38.84)	86.28	(41.85)
AIMSWeb3	78.21	(40.15)	78.86	(41.21)
TOSCRF (<i>N</i> =28)	74.07	(10.64)	77.18	(14.41)
Total = 96				

Note: Scores are words read correctly per minute. TOSCRF = Test of Silent Contextual Reading Fluency. RR = Repeated Reading. WR = Wide Reading. C = Comparison.

TABLE 5
Pretest Group Differences

<i>Measure</i>	<i>df</i>	<i>F</i>	<i>p</i>
AIMSWeb	2,86	.76	.47
WJ- LWID	2,68	.52	.60
WJ-PC	2,86	1.05	.36
TOSCRF	2,84	1.75	.18
TOSRE	2,81	2.25	.11

Note: AIMSWeb = AIMSWeb Oral Reading Fluency. WJ-LWID = Woodcock Johnson III Letter-Word Identification. WJ-PC = Woodcock Johnson III Passage Comprehension. TOSCRF = Test of Silent Contextual Reading Fluency. TOSRE = Test of Sentence Reading Efficiency.

and standard deviations are reported for the TOSRE because standard scores were unavailable.

In Table 4, the words correct per minute (WCPM) pre- and posttest means and standard deviations are reported for the three groups for the AIMSWeb ORF measure. The pre- and posttest standard score means and standard deviations are reported for the TOSCRF. Students took the same 3 AIMSWeb 1-minute ORF measures at the 8th-grade level for pre- and posttest. Median scores were used for the analysis.

To evaluate the success of group randomization, between group differences in pretest scores were examined using a series of one-way analyses of variance. There were no statistically significant differences in pretest scores across the groups, with *p* values ranging from .11 to .60 (see Table 5).

Analysis of Intervention Effects

To evaluate the overall group differences in the posttest means, three analysis of covariance (ANCOVA) analyses were conducted; one for each outcome. ANCOVA is appro-

TABLE 6
Adjusted Posttest Mean Differences

<i>Measure</i>	<i>F</i>	<i>df</i>	<i>p</i>	<i>Adjusted Means</i>		
				<i>C</i>	<i>RR</i>	<i>WR</i>
AIMS	.16	2,85	.85	85.40	83.82	85.78
WJ-R	.65	2,88	.53	71.51	73.02	73.15
WJ-C	.16	2,87	.85	71.12	71.86	72.62
TOSCRF	.50	2,82	.61	76.16	75.60	77.44
TOSRE	.314	2,74	.73	14.84	13.72	14.48

Note: *Raw scores used. AIMSWeb = AIMSWeb Oral Reading Fluency. WJ-R = Woodcock Johnson Word Recognition. WJ-C = Woodcock Johnson Comprehension. TOSCRF = Test of Silent Contextual Reading Fluency. TOSRE = Test of Silent Word Reading Efficiency. C = Comparison. RR = Repeated Reading. WR = Wide Reading.

priate in this case because it accommodates more than two groups and “adjusts” outcomes according to differences in pretest scores.

Main effects for each outcome are summarized in Table 6. There were no statistical differences due to treatment. The overall adjusted mean for all groups was 85.00 (*N* = 89). Adjusted group means (i.e., adjusted for pretest differences) for the AIMSWeb measure are similar, ranging from 83.82 in the repeated reading group (*N* = 33) to 85.78 in the wide reading group (*N* = 34). Adjusted posttest means for WJ III Letter-Word Identification ranged from 71.51 in the comparison group (*N* = 29) to 73.15 in the wide reading group (*N* = 34), $F(2,88) = .65$; $p = .53$, while the adjusted means for WJ-III Passage Comprehension ranged from 71.12 for the comparison group (*N* = 33) to 72.62 in the wide reading group (*N* = 34), $F(2,87) = .16$; $p = .85$. For the TOSCRF, adjusted posttest means ranged from 73.56 in the wide reading group (*N* = 25) group to 77.67 in the repeated reading group (*N* = 33), $F(2,74) = .314$; $p = .73$. For the TOSRE, adjusted posttest means were 13.24 for the wide reading group (*N* = 34) and 15.92 for the comparison group (*N* = 29), $F(2,82) = .50$; $p = .61$.

Effect Sizes

The effects of the two treatment conditions and the typical practice comparison condition were calculated for each measure (see Table 7). The effect size, Cohen’s *d*, was calculated as the difference between the mean posttest score for the intervention condition minus the mean posttest score for the comparison condition divided by the pooled standard deviation. Effect sizes can be interpreted as $d = .20$ as small, $d = .50$ as medium, and $d = .80$ as a large effect (Cohen, 1988).

Effect sizes ranged from $d = -.26$ to $d = .27$, usually hovering around no effect or favoring the comparison conditions versus the treatment conditions or the repeated reading condition over the wide reading condition. This does not take into account the effect sizes for the TOSRE measure which is still a measure experimental in nature. Because the confidence intervals for many comparisons spanned zero, it is important to interpret these effects with caution as they do not differ significantly from zero.

TABLE 7
Pretest to Posttest Standardized Mean Difference Effect Sizes with 95% Confidence Intervals

Measure	RR vs C	WR vs C	RR vs WR
WJ-LWID	ES = $-.05$ ($-.55$ to $.44$)	ES = $-.11$ ($-.60$ to $.39$)	ES = $.06$ ($-.42$ to $.54$)
WJ-C	ES = $-.10$ ($-.60$ to $.40$)	ES = $-.20$ ($-.69$ to $.30$)	ES = $.10$ ($-.38$ to $.58$)
AIMSWeb	ES = $-.08$ ($.25$ to $-.57$)	ES = $-.26$ ($.25$ to $-.75$)	ES = $.18$ ($-.30$ to $.66$)
TOSCRF	ES = $.04$ ($-.46$ to $.53$)	ES = $-.23$ ($-.73$ to $.27$)	ES = $.27$ ($-.21$ to $.75$)
TOSRE	ES = $-.31$ ($-.81$ to $.19$)	ES = $-.21$ ($-.70$ to $.29$)	ES = $.10$ ($-.38$ to $.58$)

Note. AIMSWeb = AIMSWeb Oral Reading Fluency. WJ-LWID = Woodcock Johnson Letter Word Identification. WJ-C = Woodcock Johnson Comprehension. TOSCRF = Test of Silent Contextual Reading Fluency. TOSRE = Test of Sentence Reading Efficiency. WR = Wide Reading. C = Comparison. RR = Repeated Reading.

DISCUSSION

This study was conducted to examine the relative effectiveness of a repeated reading and wide reading intervention on the fluency, comprehension, and word recognition of high school students with significant reading disabilities. Although implementing fluency interventions with younger readers in a peer-pairing format is a historically documented and commonly accepted practice (Chard et al., 2002; Meyer & Felton, 1999) much less is known about the efficacy of such approaches with older students with learning disabilities, particularly those with seriously impaired reading. Results indicated no significant effects for fluency, comprehension, and word recognition for either intervention condition. Neither fluency intervention proved to be beneficial when contrasted to a typical practice comparison group who did not participate in oral reading practice.

The findings of this study contrast with those reported for fluency interventions with younger students with reading disabilities, which have yielded more positive outcomes (Chard et al., 2002; National Institute of Child Health and Human Development, 2000). The findings of this study also contrasted with results often reported for interventions that implement peer tutoring, which has demonstrated positive effects on phonological awareness, phonics, fluency, and comprehension outcomes for students who range in grade and ability levels (e.g., Fuchs, Fuchs, & Kazdan, 1999; Mathes & Babyak, 2001; Mathes, Howard, Allen, & Fuchs, 1998; Mathes et al., 2003).

The current study does not support the practice of providing fluency interventions utilizing peer-pairing formats for severely impaired high school readers. Students in this study had significant reading disabilities, with pretest scores in the 5th percentile or lower on standardized measures of word recognition, passage comprehension, and fluency. An important implication of this study is that the implementation of practice activities in the absence of direct instruction may be inadequate for high school students with such severe reading impairments. This study was not designed with the intention of meeting all of the instructional needs of the students, but to address the efficacy of a commonly implemented intervention procedure—engaged reading practice using repeated reading or continuous reading approaches designed to support the development of fluency. The interventions in this study did not include instruction in word-level skills, vocabulary knowledge, or strategies to enhance comprehension. Syntheses of intervention research conducted with adoles-

cent struggling readers (Edmonds et al., 2009; Scammacca et al., 2007) suggest that interventions with older students with severe reading difficulties may be more effective if they include instruction designed to support decoding, vocabulary, and reading comprehension.

Although peer-pairing formats have demonstrated efficacy with adolescents with reading difficulties (e.g., Harris, Marchand-Martella, & Martella, 2000; Mastropieri et al., 2001), they may be inappropriate for classes in which all students have seriously impaired reading, particularly if there are not opportunities to pair students who are better readers with poorer readers. A synthesis of research of fluency interventions for struggling readers in grades 6–12 (Wexler et al., 2008) showed that interventions that consistently improved reading rate outcomes included (a) a previewing procedure such as listening to an audiotope or model of good reading before reading text or (b) provision of corrective feedback (i.e., having an adult or more competent partner provide corrections while a student is reading). As students in the current study all had severe decoding difficulties, it is likely that peer pairing failed to result in sufficient appropriate modeling and feedback. Although Mastropieri et al. (2001) found positive results for a 7th-grade peer-tutoring intervention that included repeated reading practice with summarization, the authors note that students with decoding difficulties reported frustration when neither student in the pair could adequately read the text or the lower-level reader could not keep up with the higher-level reader. Since we conducted this study, Chard et al. (2009) examined the research addressing the effectiveness of the repeated reading approaches for improving fluency for students with learning disabilities. They report that, using criteria for rigorous research, repeated reading should not be considered an evidence-based practice for students with learning disabilities.

In the current study students received intervention for an average of 12.2 hours, with individual sessions lasting 15–20 minutes. For these severely impaired readers, a more intense intervention (i.e., increasing intervention dosage and content) may have been required. Even when direct instruction is provided over the course of a semester to adolescents with severe reading difficulties and low oral language skills, positive outcomes are not assured (e.g., Denton et al., 2008). Denton et al. examined the effectiveness of a multicomponent reading intervention implemented with middle school students with severe reading difficulties. The students in the Denton et al. study had similar reading levels to those in this study (i.e., standard scores approximately two standard

deviations below the mean at pretest). Students in the Denton et al. study received daily, explicit, small-group instruction for 50 minutes each day over 13 weeks. Treatment students in the Denton et al. study did not demonstrate significantly higher outcomes in word recognition, comprehension, or fluency than students in the school's typical instruction comparison group, and neither group demonstrated significant growth over time.

Limitations

This study was designed to control variables in order to effectively answer the primary research question. It was implemented, however, in a practical school context, with resulting limitations. The primary limitation in this study resulted from chronic absenteeism of participating students. When one student was absent, repairing that student with another partner was often difficult because of social issues or because the teacher did not have another partner whose reading level was appropriate for the student. This also influenced the overall total time in intervention. Because of chronic absenteeism, many students in this study were forced to work in trios, rotate partners, or work alone, and some students had to work independently several times when their partners were repeatedly absent. In the Fuchs et al. (1999) study, they handled this issue by switching partners daily. This is a challenge, however, when the intervention is being implemented in small special education classes. When tutors in this study paired students with temporary partners who may not have been appropriate reading-level matches or had students work independently because of partner absenteeism, the quality of the intervention may have been compromised.

Another limitation of the study involves the nature of the text used. It is possible that using expository text, even when at the reading level of the students, was too complicated for a majority of the sample. Therefore, fluency growth might have been influenced by the nature and level of the text students used to practice reading more fluently.

Implications for Practice and Future Research

In the current study students were purposively selected because they demonstrated significant reading disabilities and represented an understudied population. However, it is important to note that findings from this study may not generalize to higher-performing students with reading difficulties.

We can conclude, however, that under conditions similar to those in this study, implementing repeated reading and wide reading interventions without more formative instruction is not likely to be valuable. It is possible that some other type of fluency intervention (perhaps at a more intense level) or the addition of explicit word-level instruction would have been more effective. For students with serious reading difficulties, interventions aimed at improving text reasoning and processing may also be important.

Special educators working in high schools are well acquainted with the challenge of providing remedial reading instruction to students with disabilities who read at very low levels. Realities such as chronic absenteeism, scheduling challenges, and inadequate personnel to provide intervention may result in special education services that resemble

low-intensity content-area tutoring or brief opportunities to practice reading aloud. Perhaps the most salient implication of this study is that these approaches are not likely to significantly impact the reading performance of students with significant reading impairment. Although the demands of completing credits toward graduation may make it challenging to deliver highly intensive reading instruction to high school students who need it, the consequences of *not* serving these students appropriately are grave—both for the individual students and for society.

More research on this topic is warranted, including replication of interventions with different populations of students under different conditions and with larger sample sizes.

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