Intervention Provided to Linguistically Diverse Middle School Students with Severe Reading Difficulties

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Abstract

This study investigated the effectiveness of a multicomponent reading intervention implemented with middle school students with severe reading difficulties, all of whom had received remedial and/or special education for several years with minimal response to intervention. Participants were 38 students in grades 6–8 who had severe deficits in word reading, reading fluency, and reading comprehension. Most were Spanish-speaking English language learners (ELLs) with identified disabilities. Nearly all demonstrated severely limited oral vocabularies in English and, for ELLs, in both English and Spanish. Students were randomly assigned to receive the research intervention ($n = 20$) or typical instruction provided in their school's remedial reading or special education classes ($n = 18$). Students in the treatment group received daily explicit and systematic small-group intervention for 40 minutes over 13 weeks, consisting of a modified version of a phonics-based remedial program augmented with English as a Second Language practices and instruction in vocabulary, fluency, and comprehension strategies. Results indicated that treatment students did not demonstrate significantly higher outcomes in word recognition, comprehension, or fluency than students who received the school's typical instruction and that neither group demonstrated significant growth over the course of the study. Significant correlations were found between scores on teachers' ratings of students' social skills and problem behaviors and posttest decoding and spelling scores, and between English oral vocabulary scores and scores in word identification and comprehension. The researchers hypothesize that middle school students with the most severe reading difficulties, particularly those who are ELLs and those with limited oral vocabularies, may require intervention of considerably greater intensity than that provided in this study. Further research directly addressing features of effective remediation for these students is needed.

In the last decade considerable knowledge has been synthesized (Ehri, Nunes, Stahl, & Willows, 2001; Khun & Stahl, 2003; McCardle & Chhabra, 2004; Snow, Burns, & Griffin, 1998), policy written and implemented (No Child Left Behind Act of 2001), and guidance provided to schools (e.g., Armbruster, Lehr, & Osborn, 2003; Sénéchal, 2006) about how to effectively instruct students with reading difficulties and disabilities in the early grades.

Though there are still significant research questions to be addressed, the research on beginning reading instruction is robust and convincing (Fletcher, Lyon, Fuchs, & Barnes, 2006). Considerably less is known about effective intervention for older readers with reading difficulties and disabilities, particularly those who are English language learners (ELLs). The purpose of this article is to describe an experimental study conducted with middle school students with significant reading disabilities, many of whom were also ELLs. The research question addressed was whether an intervention designed to teach code-based skills, fluency, and comprehension, incorporating English as a Second Language (ESL) practices, would be associated with significantly better reading outcomes for students with significant and persistent reading difficulties than outcomes demonstrated by students who received the school's typical remedial reading or special education instruction.

Older Students with Reading Difficulties: State of the Research

Several syntheses have examined the effectiveness of reading interventions with older students with reading difficulties (Edmonds et al., in press; Scammacca et al., 2007) as well as adults who are learning to read (Kruidenier, 2002). In the Edmonds et al. synthesis, interventions conducted with older readers (grades 6–12) that primarily addressed word study, fluency, comprehension, and multicomponent approaches to improving reading comprehension were examined. Twenty-nine studies were located, and 13 of these met criteria for the synthesis. The synthesis was conducted examining comprehension outcomes for treatment and comparison students. Results indicated a mean weighted average effect size of .89. The effects of word-level interventions, comprehension interventions, and multicomponent interventions were examined separately and were associated with medium to high effects on reading comprehension. Similarly, Scammacca and colleagues conducted a meta-analysis that included many of the studies in the Edmonds et al. review but extended the grade levels from 4th to 12th and included more recent studies. Analyzing approximately 31 studies, they derived similar findings ranging from moderate to large effects on reading comprehension outcomes when treatment students were compared with control students. Effect sizes were lower when outcomes from standardized rather than researcher-developed measures were considered. They also reported that studies including participants with learning disabilities yielded moderate to high effects on reading comprehension. Overall, these syntheses indicate that many students with severe reading disabilities benefit from interventions that address basic word-level reading and those that integrate word reading with comprehension instruction. Few studies (e.g., Klingner & Vaughn, 1996) reported in these syntheses addressed students with reading difficulties who were ELLs.

These findings suggest that interventions with older students can be moderately effective in improving reading comprehension outcomes, though the level of intensity needed to close the gap between struggling older students and their peers may require extensive and long-term interventions (Scammacca et al., 2007). These findings lend support to the notion that older readers are generally responsive to reading interventions, and we need not consider adolescents with reading difficulties too old for remediation (Ehren, Lenz, & Deshler, 2004).

ELLs with Reading Difficulties

Older students who are ELLs and demonstrate significant reading difficulties have unique challenges. Not only are they struggling with word reading, but they also have difficulty with word meaning. Furthermore, these students have often been deprived of adequate background knowledge because of a lack of reading skills as well as contextual factors more likely to be present with ELLs that compromise successful reading including: (a) being less likely to attend schools with highly qualified teachers, (b) being more likely to move frequently with disconnected learning opportunities, and (c) lack of access to books and materials in the home and community (Hansen, 1989; Kennedy & Park, 1994).

Instructional Needs of Older Students with Reading Difficulties

There is a crisis in middle school, with more than 25 percent of students unable to read well enough to adequately identify the main idea of passages (Kamil, 2003). Older students with reading difficulties read less, and teachers typically find ways to circumvent text reading so that these students' access to print is minimal.

The RAND Reading Study Group (2002) was charged by the U.S. Department of Education with identifying the most pressing issues related to reading research. They focused attention on reading comprehension with older students largely because these students (a) are making inadequate progress on the National Assessment of Educational Progress with no change in the percentage of eighth-graders scoring at or above the Proficient level between 1992 and 2005 (U.S. Department of Education, 2005), (b) are unable to adequately learn from content area texts, and (c) demonstrate unacceptable achievement gaps among students from various demographic groups. The RAND Study Group recognized the importance of the skills and strategies associated with improved outcomes for older readers with significant reading difficulties.

One possible explanation for the low reading skills of older learners is that many possess inadequate knowledge of the alphabetic principle and word reading. Curtis and Longo (1999) indicate that as many as 10 percent of all older readers have difficulty with word-level reading. When considering the subgroup of students with reading difficulties the number could be as high as 60 percent (Fletcher, 2007). There are many older students who have not adequately mastered the foundation skills of word reading, which in turn influences their fluency and text comprehension. For example, in a recent study examining the word reading skills, fluency, and comprehension knowledge of middle school students with reading difficulties, more than half of the sample demonstrated significant difficulties with word reading (Fletcher, 2007).

Another possible explanation for the reading difficulties of older students is that they lack adequate understanding of word meaning (i.e., vocabulary) and adequate reasoning abilities to comprehend text. Engaging students in constructing and interpreting meaning yields improved knowledge of words, particularly for low achieving students (Dole, Sloan, & Trathen, 1995; Jenkins, Matlock, & Slocum, 1989). Additionally, older students benefit from learning reading comprehension strategies such as comprehension monitoring, generating and answering questions, and summarization (Edmonds et al., in press).

A third possible explanation is that older students with reading difficulties lack the task orientation and disposition toward reading to effectively acquire reading proficiency. Guthrie and Wigfield (2000) report that students who are more engaged in reading are also more likely to use reading strategies associated with reading comprehension.

METHOD

This study was designed to provide initial findings on the effectiveness of a multicomponent reading intervention implemented with middle school students with severe reading difficulties (most identified as having learning disabilities), including those who are ELLs, and the extent to which their outcomes in word reading, vocabulary, and comprehension could be improved. The intervention used in this study was a significantly modified version of a phonics-based remedial program (Wilson, 1998) that included ESL practices (Echevarria, Vogt, & Short, 2004), vocabulary instruction (Beck, McKeowen, & Kukan, 2002; Graves, 2006), fluency (Chard, Vaughn, & Tyler, 2002), and comprehension strategies (Klingner, Vaughn, & Boardman, 2007).

Context

This study was conducted in one middle school that served about 750 students in grades 6–8 in an urban school district in the Southwest. During the year of the study the school population was 13.6% African American, 82.2% Hispanic, 3% White, .9% Asian, and .3% Native American. Ninety-three percnt of students were identified as economically disadvantaged, and 43.6% had limited English proficiency. Based on the state's evaluation system, the school was rated Academically Unacceptable, with 52% of students in grade six, 48% in grade seven, and 52% in grade eight passing the reading portion of the state-mandated accountability test during the previous school year. The study was conducted during the second semester of the school year.

Participants

Selection—Sixty-four sixth- through eighth-grade students who had been assigned to eight remedial or special education reading classes were screened using fifth-grade oral reading fluency passages from the Dynamic Indicators of Basic Early Literacy Skills (DIBELS; Good & Kaminski, 2003). Students were selected for the study if they were unable to read at least 80 words correctly per minute (wcpm) on this passage. This criterion was selected because it is a common benchmark denoting "at-risk" status for grade five, which represents one to three grade levels below that of all students. Forty-one students qualified for the study, with scores ranging from 10 to 79 wcpm. Parent informed consent and student assent for study participation was obtained from all except one student. During the course of the study, one student was sent to an alternative school for misbehavior and one student moved out of the school, resulting in a total of 38 participants who completed the study. Once identified, students were randomly assigned within classrooms to one of two conditions: (a) the treatment group, who received the research intervention ($n = 20$), or (b) the typical practice group, who continued to attend the remedial reading or special education classes to which they had been assigned by the school ($n = 18$). Demographic information for the students is found in Table 1.

Receptive Vocabulary—At posttest, we administered the Peabody Picture Vocabulary Test (PPVT III; Dunn & Dunn, 1997), a test of receptive vocabulary. The PPVT was given to all students in English (with the exception of one student who was absent from school and could not be tested) and in both English and Spanish to students with school-identified Limited English Proficiency. The Spanish assessment was administered to 12 students in the treatment group and 11 in the typical practice group. It is not possible to report group standard score means for the Spanish test, because several students performed so poorly that it was impossible to assign them standard scores. Therefore, we report English and Spanish test scores for individual (unidentified) students in Table 2.

Procedures

After students who qualified for the study were randomly assigned to the treatment or typical instruction condition, students assigned to the treatment condition were divided into instructional groups ranging from two to four students. The goal was for students to participate in the intervention for a total of 47–55 daily 40-minute sessions over the course of about 13 weeks. Attendance data collected as part of the study indicated that students in the treatment group attended an average of 43 sessions ($SD = 9$), receiving an average of 29 hours of instruction ($SD = 6$; range 15–35). Students missed intervention primarily because of school absences or disciplinary actions (i.e., in-school suspension, alternative campus placement, in principal's office). The treatment groups were taught by two teachers who participated in at least 10 hours of training and received ongoing coaching and supervision from the second author of this article, a doctoral student with extensive experience teaching

high school students with reading disabilities. One interventionist was a certified special education teacher with 9 years of experience and the other was experienced in bilingual education.

Measures

At pre- and posttest the investigators collected data to assess student growth in the domains of reading fluency, comprehension, word identification, and spelling. All assessments were administered by trained graduate students. Pretests were individually administered during the 3 to 4 weeks prior to the beginning of treatment, while posttesting took place during the week immediately following treatment completion. The following assessment battery was chosen because it assesses a broad range of reading and reading-related outcomes and includes only measures with strong psychometric properties.

Reading Comprehension—Students' comprehension achievement was assessed using the Woodcock–Johnson Tests of Achievement III (WJ III; Woodcock, McGrew, & Mather, 2001) 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 close procedure.

Word Identification and Spelling—Students' untimed word reading achievement was assessed using the WJ III Letter-Word Identification and Word Attack subtests. Scores from these subtests were used to derive a single cluster score in Basic Reading Skills. Timed word identification was assessed with the Test of Word Reading Efficiency (TOWRE; Torgesen, Wagner, & Rashotte, 1999) Sight Word Efficiency subtest. In the TOWRE students are provided with a list of words presented in order of increasing difficulty. The raw score is determined by the number of words read correctly in 45 seconds. Students' spelling achievement was assessed using the WJ III Spelling subtest.

Fluency—At pre- and posttest, students' reading fluency was assessed via timed reading of fifth-grade-level connected text from the DIBELS series (Good & Kaminski, 2003). At each administration, students read three passages, and the mean score was used in the analysis. Oral reading fluency passages assess both reading accuracy and rate.

Social Skills and Problem Behavior—One time during the semester the teachers who provided intervention to the treatment group and those who provided instruction to the typical practice group completed the teacher form of the Social Skills Rating System (SSRS; Gresham & Elliott, 1990) for their respective students. Teachers indicated whether certain behaviors and characteristics were present for a student "never," "sometimes," or "very often." The SSRS yields standard scores in three domains: Social Skills, Problem Behaviors, and Academic Competence. Only scores in the first two domains were analyzed in this study. Internal consistency reliability is reported for the teacher form at .93–.94 for Social Skills and .82–.86 for Problem Behaviors, and test-retest reliability is reported as .85 for Social Skills and .84 for Problem Behaviors.

Data Analysis

Descriptive statistics were calculated for all measures. Data were analyzed through the application of a repeated measures analysis of variance (ANOVA) with one between-subject factor (assignment to condition) and one within-subject factor (time in instruction). To inform hypotheses regarding factors that may have influenced student progress, we examined the correlations between the dependent variables and (a) standard scores on the

SSRS Social Skills and Problem Behavior rating scales, (b) hours of intervention received, (c) English PPVT vocabulary scores, and (d) Spanish PPVT vocabulary scores.

Finally, student scores on the WJ III Basic Skills cluster were compared to a benchmark designating adequate response to intervention (standard score of 93), following a procedure commonly applied in intervention studies with younger students (e.g., Mathes et al., 2005). We considered the WJ III Basic Skills cluster a valid marker for response to intervention for students in this study based on their extremely low scores in Basic Reading at pretest, with the assumption that this decoding indicator would be more sensitive to student response than a reading comprehension assessment for this sample.

Intervention Description

Intervention was provided to students in the treatment condition in small groups of two to four students with one teacher, in daily sessions of about 40 minutes over about 13 weeks. Students received explicit and systematic instruction in word-level reading skills as well as comprehension, vocabulary, and fluency. Minimal emphasis was given to instruction in phonological awareness skills. The intervention was designed to be individualized, rather than highly prescriptive, to allow response to student needs. Soon after the onset of intervention, in response to students' severe word-level reading deficits, the decision was made to place heavy emphasis on phonics, word recognition, spelling, and fluency. Instruction in vocabulary and comprehension strategies was integrated into the intervention, but the majority of lesson time was spent in explicit word-level instruction and practice, with application of skills in connected text reading with teacher support. Over the course of the intervention, somewhat greater emphasis was placed on vocabulary and comprehension strategy instruction, but the primary focus remained on word reading, spelling, and fluency. ESL instructional practices were incorporated into the intervention, including enhanced vocabulary instruction using visuals, concrete examples, and explicit instruction. Teachers also took care to provide information to build background knowledge related to text passages before and during reading to enhance comprehension.

Decoding instruction was provided using an adaptation of a published program derived from an Orton Gillingham reading approach (Wilson, 1998). Students applied decoding skills in decodable text. For fluency practice, students engaged in repeated reading of nondecodable expository text. Expository text was selected because it represents the most common type of text struggling readers in secondary school are asked to comprehend in their content-area classes. Passages ranged from 133 to 451 words in length. Novels were also incorporated for fluency practice and comprehension strategy application and to motivate students to read and actively participate in instruction.

The intervention was structured around a 2-day cycle focusing on decoding and encoding on alternating days. Table 3 illustrates the major components of the intervention on each day of the cycle.

Decoding Day—During a decoding day, students began by briefly reviewing letter sounds and sound patterns. During the second segment of the lesson, the teacher introduced or reviewed some rule for decoding in the English language, such as the "silent *e* rule." Next, students practiced reading words that followed this specific pattern or reviewed previously taught patterns. Students also reviewed sight words and irregular words. Next, students practiced reading sentences and connected text that reflected word patterns they had recently learned. Students also read novels specifically selected to be motivating to middle school students but to be accessible to students in this study, given their reading levels. Before, during, and after reading, teachers provided direct instruction in and opportunities to discuss key vocabulary words. Finally, teachers instructed students in comprehension strategies such

as finding the main idea of a text or generating questions. Students also practiced reading connected text aloud to develop oral reading fluency.

Encoding Day—During the encoding days, teachers followed a similar lesson plan, but students practiced many of the skills in reverse. For example, during the first segment of the lesson, instead of seeing a letter and identifying its sound, teachers dictated a sound and students selected the letter that represented that sound from a group of letter cards in front of them. During the second part of the lesson, teachers reviewed the concept or rule they had taught on the prior decoding day, but focused on how to use that particular rule in spelling. On the encoding day, students also spent about 10 minutes practicing spelling words and writing sentences that teachers dictated. These words all followed the patterns the students had been previously taught. Finally, students practiced text reading from novels and other connected text and practiced applying comprehension strategies just as they had during the decoding day.

Typical Practice—Instruction in the typical practice condition was delivered by six teachers. For each teacher, two observations of typical reading instruction were conducted by a single observer for each teacher, recording lesson activities with running field notes. Observations revealed a variety of instructional practices in the different classes. During some observations, students participated in test preparation (e.g., completing worksheets related to concepts on state reading tests). These were usually completed individually and then checked with the teacher. Other instruction observed included teachers reading aloud to students, as well as the implementation of a "newspaper unit" in which students were observed skimming newspapers, selecting articles they wanted to read, and independently reading and summarizing the articles. In one class the teacher implemented Corrective Reading (Engelmann, Hanner, & Johnson, 1999), a Direct Instruction reading program designed to teach decoding and comprehension skills. During the observations, instructional time in the typical practice classrooms was sometimes interrupted so teachers could focus on behavior management issues. During these periods, students typically worked independently without teacher feedback.

Fidelity of Implementation

A crucial element of scientifically based research is the verification of fidelity of treatment implementation. Also known as treatment integrity, fidelity of implementation describes the intervention in sufficient detail to allow for replication, and provides confidence that the intervention described was truly implemented in the research. In this study, each teacher who provided the research intervention was observed by the second author three times using a treatment integrity checklist to determine the degree that the intervention was implemented as planned. Treatment integrity was calculated as the percentage of items on the checklist completed correctly. Average fidelity ratings were between 91% and 98% for both interventionists.

RESULTS

Descriptive statistics were calculated for all pre/post measures for the treatment and typical practice groups. These are reported in Table 4.

The results of the repeated measures ANOVA revealed only one statistically significant result at the .05 level, a main effect for time (pretest to posttest) indicating that both groups improved on the Sight Word Efficiency subtest of the TOWRE, with a small effect size (*Eta* squared .104). After correction for conducting multiple comparisons, even this effect was nonsignificant. Tests of within-subjects effects revealed no time by group (treatment vs.

typical practice) interactions that were significant at the .05 level. Effect sizes on all measures for both groups were small, and some were negative.

Following this analysis, and to inform hypotheses related to students' lack of progress, we conducted correlations between posttest scores on several dependent variables (i.e., the WJ III Letter-Word Identification, Word Attack, Spelling, and Passage Comprehension subtests; TOWRE; oral reading fluency) and the Social Skills and Problem Behavior standard scores from the SSRS, the hours of intervention received by treatment group students, English PPVT vocabulary scores, and Spanish PPVT vocabulary scores. Significant correlations were found between students' SSRS Social Skills and WJ III Basic Reading Skills Cluster standard scores ($r = .33$; $p < .05$) and between Problem Behavior and WJ III Spelling scores ($r = .36$; $p < .05$). In addition, significant correlations were detected between students' English PPVT standard scores and their scores on the WJ III Letter-Word Identification ($r = .35$; $p < .05$) and Passage Comprehension subtests ($r = .56$; $p < .01$).

Standard score performance of 93 (the 30th percentile) or above on the WJ III Basic Reading Skills cluster score has been widely used as a postintervention benchmark to determine elementary school students' adequate response to intervention (Mathes et al., 2005). This benchmark was deemed applicable to the population of very low-skilled readers who participated in this study, given the severe deficits in decoding demonstrated by all participants at pretest. No student met this benchmark at the beginning of the study, and only one student in the treatment group and none in the typical practice group met the benchmark at posttest.

DISCUSSION

In this study we provided an intervention to older students with severe reading difficulties who could be characterized as "minimal responders" to previously provided intervention. While the quality of this previous instruction is not known, all of these students had participated in special and remedial education designed to improve their reading; some had received this intervention for several years. The pretest scores of students who participated in this study indicated performance more than two standard deviations below the mean in reading comprehension and spelling and nearly as low in decoding. Students also displayed nearly universally low receptive oral language skills, whether their native language was English or Spanish, with only 7 of 37 students performing within one standard deviation of the mean in English vocabulary and only 4 of the 23 for whom Spanish was the dominant language performing at this level in Spanish. Despite the provision of carefully developed, explicit, and systematic small-group (2–4 students) reading instruction in daily 40-minute sessions over the course of several weeks, treatment students did not demonstrate significantly higher outcomes on any reading measure than students who received the school's typical remedial reading or special education reading instruction.

Perhaps most concerning is that neither group of students demonstrated significant standard score growth over the course of the study. Because neither group had significant losses of standard score points on the norm-referenced measures, it appears that they did not lag further behind their peers at the conclusion of the study. However, it is clear that these severely impaired readers required intervention that would accelerate their progress toward closing the gap with their peers rather than maintain their deficit levels, and neither the typical practice approach nor the research intervention was successful in accelerating students' reading growth. A similar finding has been reported in research on student progress in special education, indicating that placement in special education tends to stabilize the performance levels of students with learning disabilities rather than accelerate their progress (Hanushek, Kain, & Rivkin, 1998).

The minimal response to intervention of students in this study may be related to individual, instructional, or contextual factors, interactions between these factors, or any combination of the above. We examine hypotheses related to each of these dimensions in the following sections. Finally, we consider the possibility that methodological limitations of this study, including the limited duration of the intervention, resulted in a failure to detect changes in student performance.

Student Characteristics

The challenges facing secondary-level students with reading difficulties are complex and multifaceted. Reading deficits at this level are often evident in students' lack of progress on assessments of reading comprehension, but these comprehension deficits may stem from impairments in word recognition, reading fluency, vocabulary, motivation to read, and/or combinations of these factors (Biancarosa & Snow, 2004). Older students with reading difficulties may also demonstrate learned helplessness, a compelling belief that they cannot be successful at reading or reading-related tasks, preventing students from engaging in these activities (Butkowsky & Willows, 1980; Chan, 1996; Tsovili, 2004). This lack of self-efficacy may be demonstrated in problem behaviors that function to enable a struggling reader to escape a potentially aversive situation (e.g., to avoid humiliation in front of peers, to relieve the boredom that results from lack of participation in classroom activities; Thomas, 1979). In addition, many students with learning disabilities demonstrate deficits in working memory, rapid naming, and metacognitive strategies such as those required for monitoring reading for sense making and organizing knowledge and concepts derived from text (Hallahan, Lloyd, Kauffman, Weiss, & Martinez, 2005).

Several of the students in this study had limited English proficiency. Research related to the development of English literacy for ELLs suggests that these students have a unique set of challenges, because they typically must develop both oracy and literacy in a second language while simultaneously developing their first language. Even though ELLs in middle school may be able to communicate adequately in English, the demands for academic language to access content-area subject matter place particular strain on second-language readers, who may struggle with limited vocabulary knowledge, understanding of syntax, and comprehension of complex sentence and text structures (Francis, Rivera, Lesaux, Kieffer, & Rivera, 2006). Students with severe reading disabilities who are also ELLs may have any or all of the characteristics described above, making remediation highly challenging.

In this study, students' minimal response to intervention may have been related to a complex pattern of habits, self-efficacy beliefs, language development, and learning difficulties. Therefore, students may have made greater progress with an intervention delivered with greater intensity for a longer period of time and/or with an approach that was more individualized than the one implemented in this study.

A student characteristic that may be strongly related to the minimal responsiveness of students to intervention is low oral vocabulary. Assessments indicated that students in both the treatment and typical practice groups almost universally displayed low English receptive oral vocabularies. This pattern of impaired vocabulary knowledge was likewise observed in Spanish for nearly all students whose dominant language was Spanish. There is a strong relationship between oral language proficiency and reading development both in native English speakers (Nation & Snowling, 2004; Roth, Speece, & Cooper, 2002) and in students learning to read in a second language (August & Shanahan, 2006).

Researchers have reported that, in Spanish–English bilingual students in the primary grades, Spanish and English oral language skills contribute significantly to reading both within and across languages (Gottardo, 2002; Miller et al., 2006) and that deficits in first language oral

development in the early grades may constitute a risk factor for later reading difficulties (Miller et al., 2006). Thus, one possible explanation for the lack of significant effects in this study was a failure to adequately address oral language development, particularly vocabulary, in the intervention. This hypothesis is supported by the significant correlations between students' English vocabulary scores and their posttest scores for the WJ III Letter-Word Identification and Passage Comprehension subtests. Although the correlation with reading comprehension was expected, it is noteworthy that there was also a significant relationship between students' oral vocabulary levels and word reading skills.

Instructional Factors

Students in this study may have had a stronger response to intervention that implemented a different instructional approach or instructional materials or if intervention had been delivered with greater intensity or longer duration. The National Literacy Panel (NLP) on Language-Minority Children and Youth examined research literature related to reading and writing instruction for ELLs (August & Shanahan, 2006) and concluded that ELLs learning to read and write in English generally benefit from approaches similar to those that have been found effective with native English speakers, but that educators may need to adapt or augment these approaches. Specifically, the NLP report emphasized the essential role of instruction designed to promote English oral proficiency to support text-level literacy (i.e., comprehension and writing). Although the ELLs in this study demonstrated severely impaired word reading skills, they may have had a stronger response to instruction that placed less emphasis on word identification skills and more emphasis on vocabulary and reading comprehension.

Alternately, the focus of the intervention may have been appropriate, but students may have benefited more if it had been delivered with greater intensity. Given their very low performance on multiple measures of reading, it is probable that students required intensive intervention for more than the one semester provided in this study.

Instructional intensity is determined by several factors, including group size, frequency of the intervention schedule (i.e., daily, two times per week), and the extent of active student engagement during instruction. Students in the treatment condition received daily intervention in small groups, but they may have benefited from intervention with increased active time on task. Anecdotal reports from the intervention teachers indicated that some students frequently exhibited disruptive and off-task behaviors during the lesson time, observations reflected in teachers' ratings of students' social skills and problem behaviors on the SSRS. The hypothesis that these behaviors may have affected reading outcomes is supported by the moderate but positive correlations between SSRS standard scores and WJ III Basic Reading Skills and Spelling outcomes. Given the substantial amount of intervention time dedicated to decoding and spelling instruction and practice for the treatment group, these correlations are noteworthy.

The length of intervention sessions in this study was determined by the school's schedule; students were provided instruction for one 40-minute class period per day. In studies reporting more robust intervention effects for older students with severe reading difficulties (Simos et al., 2002; Torgesen et al., 2001), intervention was provided in reading clinics with considerably greater intensity. Torgesen and colleagues provided students in grades 3–5 with nearly 2 hours daily of intensive one-to-one reading intervention over 8 weeks. Students in this study made large and significant gains on standard scores in word attack, word identification, and comprehension, maintaining these gains for 2 years following the intervention. Similarly, in the context of a brain imaging study, Simos and colleagues provided intensive intervention to eight students 7–17 years of age in a reading clinic setting for about 2 hours per day over an 8-week period. Students' pretest scores in the WJ III Basic

Reading composite ranged from the 1st to the 18th percentile. After 8 weeks of intervention, posttest standard scores ranged from the 38th to the 60th percentile, and six of the eight students had scores at or above the mean. These studies did not include students with limited English proficiency.

Contextual Factors

A variety of socio-cultural factors can affect students' academic progress, including their socioeconomic status, educational histories, and cultural backgrounds as well as the degree of alignment between their home and school cultures. For ELLs, factors such as native language levels of language and literacy development, length of exposure to English, and the nature of instruction and support in second language development are likewise important (Francis et al., 2006).

Aspects of the school context can also strongly influence student progress. In this study, students' failure to make appreciable progress in reading may be related to their attendance at an underperforming school. Specifically, they may not have been sufficiently supported or encouraged to implement their newly learned effective reading skills and strategies in settings outside of the reading intervention room.

Summary: Intervention with Minimal Responders

Students in this study had failed to demonstrate adequate response to previous intervention provided in special education and/or remedial reading settings. Pretest scores indicated intractable reading difficulties that may have been more successfully addressed with intervention of greater intensity (i.e., longer sessions, reduced group size, increased active involvement) and/or longer duration.

Designing and implementing appropriate interventions for the lowest responders is an understudied area of research. Layering the low English vocabulary development of these students (for both native English speakers and ELLs) onto their reading difficulties provides for additional instructional needs resulting in a group of students who are very difficult to remediate. We simply know very little about effective interventions and the amount of time required to influence these students' reading outcomes. It may be that considerably more intensive interventions (e.g., 2 hours per day) over considerably longer amounts of time (e.g., 2 years rather than 13 weeks) are required to improve outcomes. This level of intervention intensity does not fit easily into existing school routines, but it is likely that to truly leave no child behind will require educators to find ways to provide students with the most severe reading difficulties with intervention of this nature.

Study Limitations

This study was limited by its relatively brief duration and its small sample size. It is possible that an extended intervention would have produced greater gains. Moreover, the small sample size and resulting low power may have resulted in a failure to detect significant group differences. Finally, although we employed measures with strong psychometric properties, these tools may not have been appropriate for the ELLs who constituted much of our sample and may not have had sufficient sensitivity to growth over time to detect significant changes over the relatively brief study duration, particularly in the low ends of the norm distributions in which our participants fell. Our results should therefore be interpreted cautiously.

Implications for Future Research

Ultimately, as emphasized by the NLP (August & Shanahan, 2006), "becoming literate in a second language depends on the quality of teaching, which is a function of the content

coverage, intensity, thoroughness of instruction, how well learning is monitored, and teacher preparation" (p. 4). This is equally true for native English speakers with severely impaired reading. The minimal response to intervention of students in this study is likely to be the result of complex interactions between individual student, instructional, and contextual factors. What is clear is that the successful remediation of severe reading difficulties in middle school students, particularly those whose native language is not English and others with low levels of oral vocabulary, will require more than simple solutions. Those in search of panaceas or quick fixes are likely to be disappointed and may do a disservice to students who are in desperate need of effective intervention.

Francis et al. (2006) suggest that, when designing effective reading instruction for ELLs, it is essential to consider the function of instruction, distinguishing between intervention designed to *prevent* reading difficulties, to *augment* generally effective instruction with strategies and approaches shown to be effective with ELLs, or to *remediate* reading difficulties that are already established. Although the research base related to effective intervention with younger struggling readers is well developed, elements of intervention that have been found effective for the prevention of reading difficulties in young children may not be effective for the remediation of reading difficulties in older students. Even with younger students, there is a general lack of research evidence regarding effective intervention for students who have had minimal response to previous supplemental intervention. Further, research must directly address features of effective remediation for middle school students with severe reading difficulties, particularly for ELLs and for students who have had minimal responsiveness to previously provided quality reading intervention.

Acknowledgments

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TABLE 1

Student Characteristics

Variable	Treatment		Typical Practice	
	n	Percent	n	Percent
N	20		18	
Gender				
Male	12	60%	14	78%
Female	8	40%	4	22%
Ethnicity				
African American	5	25%	4	22%
Hispanic	15	75%	14	78%
Caucasian/Asian/other	0	0%	0	0%
Served by special education	16	80%	17	94%
Identified limited English proficiency	12	60%	10	56%

TABLE 2

English and Spanish Standard Scores on the Peabody Picture Vocabulary Test III, by Participant

Student	Group	English Standard Score	Spanish Standard Score
1	TP	70	
2	TP	40	<55
3	TP	95	75
4	TP	51	<55
5	TP	72	80
6	TP	79	<55
7	TP	91	
8	TP	68	<55
9	TP	86	
10	TP	97	
11	TP	90	
12	TP	56	63
13	TP	85	
14	TP	63	61
15	TP	110	108
16	TP	77	<55
17	TP	75	
18	TP	74	80
19	T	84	
20	T	70	71
21	T	72	89
22	T	62	86
23	T	68	
24	T	49	71
25	T	75	
26	T	65	<55
27	T	63	<55
28	T	64	62
29	T	76	
30	T	71	74
31	T	80	91
32	T	20	61
33	T	73	82
34	T	79	
35	T	53	83
36	T	61	
37	T	76	

Note. TP = Typical practice group; T = Treatment group.

TABLE 3

Intervention Lesson Plan

Time	Decoding (Reading) Day	Encoding (Spelling) Day
1–3 minutes	Decoding sound practice	Encoding sound practice
10–15 minutes	Introduce and review decoding strategies	Introduce and review encoding strategies
3–5 minutes	Word reading practice	
3–5 minutes	Sight words and irregular words	Sight words and Irregular words
5 minutes	Sentence reading	Dictation spelling practice (8–10 minutes)
15 minutes	Text reading for comprehension and vocabulary strategy practice and fluency practice	Text reading for comprehension and vocabulary strategy practice and fluency practice

TABLE 4

Performance on Outcome Measures by Group

Measure	Treatment (n = 20)		Typical Practice (n = 18)	
	Pretest M (SD)	Posttest M (SD)	Pretest M (SD)	Posttest M (SD)
Woodcock–Johnson III				
Basic reading	76.48 (9.29)	76.45 (8.13)	75.21 (8.18)	72.06 (10.22)
Passage comprehension	65.19 (13.39)	62.30 (9.36)	67.68 (10.73)	64.39 (11.52)
Spelling	67.19 (14.11)	68.00 (10.19)	67.37 (8.53)	68.78 (9.11)
TOWRE				
Sight words	74.29 (7.08)	75.35 (6.56)	70.47 (7.74)	72.94 (7.97)
Oral reading fluency	59.04 (21.09)	56.06 (17.91)	51.20 (22.27)	47.92 (21.53)

Note. All scores are standard scores (*M* = 100, *SD* = 15) except for Oral Reading Fluency, which is reported as the number of words read correctly per minute on a fifth grade level passage; TOWRE = Test of Word Reading Efficiency; Sight Words = Sight Word Efficiency Subtest.