Intensifying Instruction

Does Additional Instructional Time Make a Difference for the Most At-Risk First Graders?

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Research is clear on the benefit of early intervention efforts and the importance of intensive instructional supports; however, understanding which features to intensify is less clear. General intervention features of group size, instructional delivery, and time are areas schools can consider manipulating to intensify instruction. Also, each of these features can vary along a continuum making them easier or more challenging for schools to implement. What is unclear is if implementing very intensive interventions early in school (first grade), which require significantly more school resources, provides accordingly accelerated student learning. This article investigates the role of intensifying instructional time for the most at-risk first graders in schools implementing research-based instructional and assessment practices within multiliteracy instructional support systems. Results indicate that students receiving more intensive intervention made significantly more progress across a range of early reading measures. Intervention features, limitations, recommendations for practice, and implications for treatment resisters are discussed.

Keywords: intensifying instruction; reading instruction; instructional time; at-risk readers

The need for and benefit of prevention and early intervention efforts in early literacy has been repeatedly demonstrated (National Reading Panel, 2000) and formally recognized by the federal government. Federal mandates within No Child Left Behind (NCLB) Act and the 2004 Individuals with Disabilities Education Act (IDEA), with its option of using a response-to-intervention (RTI) approach, require the use of scientifically based instructional practices to support student learning. We have come to this understanding based on the convincing and compelling demonstration that (a) most reading difficulties can be prevented with effective early instructional experiences (Vellutino, Scanlon, & Lyon, 2000) and (b) students who have reading difficulties struggle with efficient and accurate word reading skills (Torgesen, 2002). This difficulty in efficient word reading negatively impacts successful and enjoyable opportunities in reading, with documented negative ripple effects on the development of vocabulary and language (Cunningham & Stanovich, 1998), comprehension (Brown & Palincsar, 1986), and motivation and attitude about reading in general (Juel, 1988). Even with this knowledge and our growing understanding about the nuances related to intervention, we have yet to determine how to meet the needs of each learner.

To assist schools in implementing RTI effectively and efficiently, we need to identify the features of interventions that have the greatest impact for the most at-risk students but are feasible to deliver (Gersten & Dimino, 2006). A better understanding of these intervention features will provide schools guidance in resource allocation (i.e., monies for materials, personnel, scheduling, etc.) and decision making (Chard & Harn, in press). As Al Otaiba, Schatschneider, and Silverman (2005) noted, NCLB requires the use of scientifically based reading research practices, which requires educators to know how to provide immediate, intensive, and effective supports as soon as students display the need—an expectation many feel is unreasonable considering researchers have not fully determined how to make each child successful.

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(Torgesen, 2005). In particular, there is a group of students (i.e., nonresponders/treatment resisters; Al Otaiba & Fuchs, 2002; Torgesen, 2001) who do not make appropriate gains even when provided evidenced-based reading instruction that works for most students. That they need “more intensive intervention” is the common refrain, but what features do we intensify? Do we increase time, explicitness of instruction, opportunities to respond? Do we decrease group size, the number of instructional components taught, or some combination of all these features? Are there other features that have a greater impact on the educational success of these students (Al Otaiba & Fuchs, 2006; Scarborough, 2005)? Even if we decide to intensify instruction by increasing time allocation, is there a critical window of opportunity for these efforts to best accelerate learning (Juel, 1988)? To begin to understand these questions, we examined the role of intensifying instructional time with significantly at-risk first graders to determine whether this intensification would make a significant difference on end-of-year reading performance. Prior to presenting the study, we review the common features of intervention.

**Intensifying Instructional Efforts**

The focal point of the majority of early reading interventions has been on improving foundational skills encompassed within the construct of phonological processing. Phonological processing includes the ability to understand and isolate the sounds/phonemes within spoken words (phonological awareness), relate these phonemes to print (alphabetic principle), and rapidly retrieve this information and apply it effectively to reading words. Torgesen, Wagner, Rashotte, and Herron (2003) demonstrated that providing intervention early on phonological processing (kindergarten and first grade) not only improves student literacy skills (as many other studies have documented), but more important, they demonstrated that students receiving these interventions closed the gap between themselves and typically developing peers and maintained this successful level of performance later in schooling. Similar findings were demonstrated by Simmons et al. (2007) where at-risk students who received the most systematic and explicit intervention focused on phonological processing across the year made significant progress and were not appreciably different than typically developing readers by the end of kindergarten.

There is general consensus about the components that should be part of reading interventions (i.e., what should be taught); however, the intensity of these interventions can vary. Discussions of intensity focus predominantly on duration (number of sessions/weeks of intervention) and increased time (Cavanaugh, Kim, Wanzek, & Vaughn, 2004). Another way of conceptualizing intensity is that it can vary across three dimensions: group size, instructional delivery, and time. Our discussion will initially focus on the effect of varying intensity across each of these features, either simultaneously or individually, and the implications of these variations on school implementation. Next, we will present a study focused on examining the effect of increased instructional time while holding content, group size, and instructional delivery constant.

**Group Size**

Students with the most intensive instructional needs require more of their instruction delivered in small groups (Bos & Vaughn, 2002). Small group instruction focused on prioritized skills increases the instructional support in meaningful ways by allowing instruction to be efficient by targeting the specific skill needs for students. In addition, small group instruction increases students’ opportunities to practice skills and receive corrective feedback from teachers to enhance learning (Howell & Nolet, 2000). Although there is no agreed on number of how many students makes a “small group,” group size can vary significantly from 1-to-1 to as many as 1-to-10. Although not conclusive for making individual student-level decisions, there is compelling research indicating that instruction provided to groups of 3 to 5 students is as effective as 1-to-1 instruction, even for the most at-risk students (Elbaum, Vaughn, Hughes, & Moody, 2000). Some students may require 1-to-1 instruction; however, prior to allocating this intensive level of resources, school personnel could try a less intensive grouping format, 1-to-3 to 5, first and intensify if student performance warrants it (Fuchs, Fuchs, Mathes, & Simmons, 1997). The use of small group formats to provide supplemental instruction may require a change in resource allocation within schools by increasing the number of personnel and space needed and the complexity of scheduling. Schools with limited personnel may have to provide “small group instruction” to struggling readers in arrangements beyond what would be instructionally effective (i.e., 8 or more). Larger instructional groups minimize the likelihood that interventions will be targeted to student instructional needs and provide the active engagement necessary to support and maximize student learning.

**Instructional Delivery**

As Lyon and Chhabra (2004) stated, “Children do not acquire reading ability naturally, easily, or incidentally”
effect sizes, 1.0 or higher. The majority of interventions were implemented from 15 to 29 minutes ($n = 17$) and had moderate to large effect sizes. The authors concluded that interventions delivered in small-group formats either two to three times per week or daily for a minimum of 15 to 30 minutes produced the greatest effects. However, none of the studies reviewed in this kindergarten meta-analysis manipulated time as an independent variable (Simmons et al., 2007). An unmeshed point related to time is considering how that time is utilized. It is not simply a matter of providing more time; it is ensuring that time is spent on critical skills related to overall reading proficiency (Harn et al., 2007; Scanlon & Vellutino, 1997). In addition, the resource allocation necessary (similar to decreasing group size) to increasing instructional time (i.e., scheduling personnel) is a significant challenge in many schools.

Simmons et al. (2007) completed a kindergarten study that specifically examined the role of instructional time on later early literacy skills. Students were randomly assigned to receive either 15 or 30 minutes of highly explicit and systematic intervention focused on phonological awareness and alphabetic understanding. Results indicated that students who received 30 minutes of intervention made significantly more growth on measures of letter identification, phonemic decoding, and word reading than students receiving 15 minutes of instruction. In addition, the most at-risk kindergarteners within the study made significantly more progress than similarly at-risk students receiving the 15-minute intervention. Finding that the most at-risk students (some may consider nonresponders; Al Otaiba & Fuchs, 2006) benefited differentially by increased time underscores the importance of this intervention feature.

To further examine the effect of additional instructional time on student outcomes, researchers at two sites (University of Oregon and University of Texas at Austin) examined the effect of intensifying instructional time from 30 to 60 minutes at the beginning of first grade. The collaboration was possible because both used the same criteria for identifying students, provided research-based interventions in schools, and used common measures at the beginning and end of the first grade year. The seven schools participating in this study all implemented a multi-tiered, schoolwide approach to allocating instructional resources (Chard & Harn, in press; Harn et al., 2007; Vaughn, Wanzek, Woodruff, & Linan-Thompson, 2007). However, there was one major difference in implementation of the tiered approach between the two sites. In the Oregon schools, students in first grade were provided three tiers, or levels of instructional supports, based on the level of instructional need demonstrated by the student. For example, a student with extremely low skills in
phonological awareness and letter-sound knowledge received the most intensive intervention available (Tier 3: 60 minutes, groups of 4 or fewer). In Texas, students with comparable skill levels were provided Tier 2 supports during first grade (Tier 2: 30 minutes, groups of 4–5 or fewer). Students were not provided Tier 3 instruction until second grade, and then only if they were still struggling. The question we examined in this study is “What is the effect of intensifying instructional time from 30 to 60 minutes at the beginning of first grade on early literacy skills of the most at-risk first-grade readers?” In other words, is providing more reading intervention time worth the resource allocation challenges?

**Method**

**Participants**

Across both sites all first-grade students’ skills in phonological awareness and alphabetic understanding were screened using the Phoneme Segmentation Fluency (PSF) and Nonsense Word Fluency (NWF) measures (Good & Kaminski, 2002; see following description). Then, 3 years after study completion, the most at-risk students at each site were selected to examine the effect of instructional time. First graders were selected for the post hoc analysis if they met the following criteria: PSF < 11 or NWF < 10. This level of performance is characterized as deficient and in the intensive instructional recommendation range according to Good and Kaminski (2002). Descriptive results for the 54 identified students at the beginning of first grade are provided in Table 1 by location.

**Measures**

**Phonological Processing**

Test of Word Reading Efficiency, Sight Word Efficiency subtest (SWE). The SWE (Torgesen et al., 1999) is a standardized, individually administered test that measures a student’s ability to quickly identify sight words. The student is presented with lists of real words and then asked to read them as quickly as he or she can. The score is the total number of words read correctly in 45 seconds. The time sampling reliability for children ages 6 to 9 years old was .97. Regarding validity, SWE correlates .89 with the Word Identification (WID) subtest of the Woodcock Reading Mastery Test–Revised (WRMT-R).

Test of Word Reading Efficiency, Phonetic Decoding Efficiency subtest (PDE). The PDE (Torgesen et al., 1999) is a standardized, individually administered test designed to measure a student’s ability to quickly identify nonwords. The student is presented with lists of nonwords and asked to read them as quickly as he or she can. The raw score is the total number of words read correctly in 45 seconds. The time sampling reliability for children ages 6 to 9 years old was .90. Regarding validity, PDE correlates .85 with the Word Attack (WAT) subtest of the WRMT-R.

Nonsense Word Fluency (Good & Kaminski, 2002). The NWF task is a standardized, 1-minute, individually administered measure that assesses a student’s knowledge of the alphabetic understanding. The measure is comprised of CVC and VC nonsense words (e.g., rav, ep), and the student is to provide the sound of each letter or read the whole word. Alternate form reliability for NWF ranges from .67 to .87, and concurrent validity with the readiness subtests of the Woodcock-Johnson Psychoeducational Test ranges from .35 to .66.

Word Identification subtest of the Woodcock Reading Mastery Test–Revised (Woodcock, 1987). The purpose of the WID subtest of the WRMT-R is to assess word reading in a nontimed manner. The WID subtest measures a student’s ability to read words from a word list that increases with difficulty. Test-retest reliabilities and validity coefficients are within acceptable ranges across age spans.

Word Attack subtest of the Woodcock Reading Mastery Test–Revised (Woodcock, 1987). The purpose of the WAT subtest of the WRMT-R is to assess word attack and phonetic analysis skill in a nontimed manner. The WAT subtest consists of 45 nonwords, arranged from easy to difficult. Test-retest reliabilities and validity coefficients are within acceptable ranges across age spans.

**Fluency in Connected Text**

Dynamic Indicators of Basic Early Literacy Skills (DIBELS) Oral Reading Fluency (ORF). The ORF task is a standardized, individually administered test of accuracy
and fluency with connected text. The student is presented with a grade-level passage and asked to read the passage aloud for 1 minute and the number of correct words read is counted. Test-retest reliabilities for elementary students ranged from .92 to .97. Criterion-related validity coefficients range from .52 to .91 (Good & Jefferson, 1998; Good & Kaminski, 2002).

### Comprehension Measure

**Woodcock Reading Mastery Test–Revised: Passage Comprehension subtest (PComp; Woodcock, 1987).** The PComp is a standardized, individually administered test of reading comprehension. PComp provides the student a sentence or brief passage with one word missing and requires the student to provide the “best word” for the passage. Test-retest reliabilities and validity coefficients are within acceptable ranges across age spans.

### Interventions

The interventions implemented across sites were selected independently by the principal investigators and not purposely designed for comparison as we are doing in the current study. While collaborating on another project, the investigators recognized an opportunity to examine the impact of instructional time for students most at risk for long-term reading difficulties; therefore, a brief description of each site’s intervention content and delivery features is provided. The interventions, though not identical, are similar on a number of variables (group size, instructional delivery). For example, both interventions included the same instructional components, and in the first semester, the percentage of time on each of the instructional components was similar across interventions even if the actual time was double in the more intense intervention. See Tables 2 and 3 for how different elements were displayed across locations.

### Less Intense Intervention

Within each building, students were homogeneously grouped based on skills in phonological awareness and alphabetic understanding and delivered in groups of four or five students. The interventionists were graduate students or research associates with the research project and had a minimum of a bachelor’s degree, with four of the seven interventionists being certified teachers. The interventionists received 15 hours of training prior to implementation and then met weekly to discuss student progress and plan for the next phases of intervention. The training focused on developing both content (word analysis, fluency, vocabulary, and comprehension) and instructional delivery skills. Training also covered effective instructional techniques, including explicit instruction, quick pacing, error correction, and scaffolding. Tutors also received training in lesson planning, progress monitoring, and group management techniques. Between training sessions, tutors prepared full sets of lesson plans to use in simulation practice sessions. Trainers provided feedback on written lessons and practice sessions to each tutor. Weekly fidelity observations were completed during the initial phases of the intervention.

### Intervention Content

**Phonics and word recognition (15 minutes; 50%).** Phonics and word recognition instruction was provided each day. Instruction included letter names, letter sounds (building from individual letter sounds to letter combinations), reading and spelling regular and irregular words, word family patterns (e.g., fin, tin, bin), and word building (e.g., work, works, worked, working).

**Fluency (5 minutes; 17%).** Daily fluency exercises addressed improving speed and automaticity for mastered skills. Each activity addressed one of three skill areas: (a) letter names and sounds, (b) word reading, or (c) passage reading. Students practiced these skills with the goal of quick and accurate responses.

**Passage reading and comprehension (10 minutes; 33%).** Students read daily short passages incorporating sounds and words previously taught through phonics and word recognition activities. The passages built from 3 to 4 words to more than 40 words, according to student skill level. Appropriate comprehension questions integrating literal and inferential thinking followed each passage. Interventionists taught students strategies for locating answers or clues to answers for the comprehension questions.
More Intense Intervention

Within each building, students were homogeneously grouped based on skills in phonological awareness and alphabetic understanding and delivered in groups of three or four students. The interventionists were school-based employees, with the majority of interventionists being educational assistants (1 out of 14 were certified teachers). The initial 6-hour training session focused on showing interventionists how to deliver the scripted intervention program. Interventionists were expected to deliver the activities within the prescribed order using the provided explicit instructional language, correction procedures, and materials. A follow-up training (3 hours) was provided 5 weeks after the start of the intervention. Additional support was also provided during the monthly fidelity observations to assist interventionists in better meeting the needs of the students. About halfway through the school year, the investigators noted the limited progress displayed by students and decided to significantly modify the intervention components (discussed in the following).

Intervention Content From November to January

Word analysis (phonics and word recognition; 35 minutes; 58%). Integrated phonological awareness, phonics, and word recognition instruction was provided each day. Instruction included letter names, letter sounds (building from individual letter sounds to letter combinations), reading and spelling regular and irregular words, word family patterns (e.g., fin, tin, bin), and word building (e.g., work, works, worked, working).

Fluency (10 minutes; 17%). Daily practice focusing on improving speed and automaticity for mastered skills was provided. Primarily nontimed, activities focused chiefly on developing automaticity in letter names, sounds, and beginning word reading.

Passage reading and comprehension (15 minutes; 25%). Students read highly decodable books that increased in difficulty and length that were designed to correspond directly with the word reading and fluency skills.

Intervention Content From February to June

Word analysis (phonics and word recognition; 15 minutes; 25%). Phonics and word recognition instruction was provided each day. Instruction included letter names, letter sounds (building from individual letter sounds to letter combinations), reading and spelling regular and irregular words, word family patterns (e.g., fin, tin, bin), and word building (e.g., work, works, worked, working).

Fluency (20 minutes; 33%). Daily fluency exercises addressed improving speed and automaticity for mastered skills. Each activity addressed one of three skill areas: (a) letter names and sounds, (b) word reading, or (c) passage reading. Within the revised materials, much more time was spent developing students’ skills in reading connected text with accuracy and pace. Most of this was accomplished having students re-read the decodable stories after completing the story with teacher support. In addition, peer-supported partner reading was also completed about once a week with stories students had already read and re-read with teacher support.

Passage reading and comprehension (25 minutes; 42%). Students read decodable stories with a variety of teacher support formats. A choral reading format was typically used when initially reading a story, followed by providing students individual turns in reading short sections for comprehension. Teachers also periodically stopped and asked questions requiring both literal and inferential answers and linked current information to previous portions of the stories. Students were also prompted to answer typical story grammar (e.g., characters, setting, action, etc.) questions at the end of each story. As previously stated, these decodable stories were re-read as described in the fluency section earlier.

Results

Due to the post hoc nature of this study, a series of exploratory hierarchical regressions was conducted to evaluate the effect of instructional time on student reading.
outcomes. For each measure, pretest scores were entered as the first covariate, followed by a variable reflecting the intervention site, either Oregon or Texas. The increase in $R^2$ associated with the addition of this latter variable (i.e., location/intensity) was the indicator of primary interest. Effect sizes (eta-squared) were calculated as well.

General descriptive results for pretest and posttest measures are presented in Table 4. Performance on the fall-administered measures by Texas and Oregon students was generally comparable on NWF and SWE. Fall differences on the PDE and on the PComp subtest of the Woodcock Reading Mastery Test were less comparable, with Oregon students outscoring students in Texas by 6 to 7 standard score points.

Table 5 presents results of the hierarchical regression analyses. The values in the column labeled Step 1 $R^2$ represent the overall posttest variance explained by pretest scores. The $\Delta R^2$ column is the increase in variance explained by the addition of location/intensity to the regression model, with positive values indicating an advantage for the more intense program offered to Oregon students. The $F$ and $p$ values reflect the statistical significance of these increases in $R^2$. The estimate of effect is expressed as eta-squared, which describes the degree of association between the independent and dependent variables, with values of .01 and less generally interpreted as small in size and values of .14 and greater being large-sized effects.

In this case, results suggest that students in the more intense intervention outperformed students in the less intense intervention on all outcome measures except passage comprehension after controlling for site-related pretreatment differences (i.e., fall-administered pretests). The effect sizes varied from medium (.022–.109) to large (.138–.500; Cohen, 1988), with the greatest differences on ORF ($\eta^2 = .194$), NWF ($\eta^2 = .165$), and SWE ($\eta^2 = .141$). The effects for word analysis ($\eta^2 = .067$), word identification ($\eta^2 = .111$), and PDE ($\eta^2 = .100$) were more moderate in size, whereas the effect for passage comprehension ($\eta^2 = .025$) did not differ significantly from 0.

Several caveats deserve mention. First, a formal approach to the analysis of these data would include controls for family-wise error rate (resulting in an adjusted alpha level of .007). Instead, we adopted a more exploratory attitude in keeping with the purpose and approach of the general project. The results suggest areas where more rigorous research using prospective, larger samples and well-controlled designs might pay dividends. For example, the obtained pattern of results shows more of a difference on fluency-based measures (PDE, ORF, NWF) than the nontimed measures for students that received a more intense intervention. Considering that

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these students received twice as much instructional time (i.e., practice, feedback), the results may not be surprising. Results are consequential however when the importance of fluency/automaticity in long-term reading is considered (Torgesen, 2005).

**Discussion**

In discussing the power of well-planned, -designed, and -implemented instruction, Engelmann (1997) stated that “acceleration [of learning] is simply a more efficient use of time” (p. 179). This study investigated the role of time with students most at risk for reading difficulties to determine whether doubling intervention time at the beginning of first grade is an efficient use of instructional time. We compared differences in student outcomes at the end of the school year to make the determination. As a reminder, these results were obtained in the context of schools implementing three-tiered instructional supports for years. It is not known if these results would be replicated without this salient contextual feature. This discussion will focus on the intervention features related to improved outcomes, suggestions for schools, and limitations and areas needing additional study.

**Effect of Intensity of Intervention**

To ensure that children develop adequate reading skills in the early primary grades, schoolwide models of instruction are needed that integrate with fidelity the basic principles of response to intervention such as early identification of students at risk for reading problems, provision of effective reading instruction, and professional development (Chard & Harn, in press; Coyne, Kame’enui, Simmons, & Harn, 2004). The interventions provided to the students had many common components that are aligned with best practice. Students were identified early and were provided comprehensive reading interventions in small groups. The interventions used explicit instructional delivery principles and were provided in addition to the instructional time devoted to reading in the general classroom. The results once again demonstrated that interventions with these features improve reading outcomes for the most at-risk readers. The mean performance across sites indicated significant growth on measures of sight word reading, word analysis, fluency with connected text, and comprehension, with most end-of-year scores being in the average range when compared to the national norms.

The major difference between the two interventions was the amount of time students spent in intervention. In the less intense intervention, students received 30 minutes of intervention for 25 weeks in first grade, whereas students in the more intense intervention spent twice as much time in intervention, 1 hour a day for 24 weeks. More time had a significant impact on student outcomes, particularly on fluency-based measures of sight word, word analysis, and passage level reading. The only measure for which there were no significant differences was passage comprehension.

The significantly greater growth in fluency for students who received the more intense intervention is noteworthy. Although early interventions have done an exceptional job in filling gaps in phonemic awareness, phonics, and comprehension, closing the gap in fluency has always remained a struggle (Torgesen, 2005). Students who received the 60-minute intervention read on average 22 words per minute by the end of intervention, a level that, although not on track, is not considered significantly at risk; whereas students who received a less intensive intervention ended first grade reading on average 15 words a minute, a level predictive of continued need for intervention support and risk for long-term reading difficulties (Good, Simmons, Kame’enui, Kaminski, & Wallin, 2002). In addition, when examining the distribution of student spring ORF performance across sites (see Figure 1), we noticed not only the significant mean level differences but also the impressive range of performance differences by intensity of support. The interquartile range for the more intense group was between 14 and 28 words per minute, compared to a range of 9 and 19 for the less intense group. The additional time appeared to impact reading fluency in meaningful ways: Students at the 25th percentile in the more intense group read similarly to the students at the 50th percentile in the less intense group. However, there are other issues to contemplate beyond time that should be considered when interpreting results. For example, students in more intense intervention started the year with higher phonics knowledge and decoding ability, a necessary skill for fluent reading. The differences in fluency growth could be due to the additional intervention time, how that time was spent (i.e., more time in fluency development), differences in student skill level, or the combination or interaction of all these issues.

By studying the lowest performers during this critical window in reading development (first grade), we can examine the issue of when to increase the intervention intensity. Related is the issue of “treatment resisters” (Torgesen, 2001), who typically are later identified from intervention studies as students who had the lowest initial skills (Vellutino, Scanlon, Small, & Fanuele, 2006). By intensifying earlier, rather than waiting until second grade or later, we may be decreasing the numbers of significantly low performers later in
school. As discussed by Torgesen (2005), student reading difficulty is “temporally and contextually derived” as it is an interaction between magnitude of the students’ reading difficulty and the intensity or quality of the instruction provided. By increasing the strength or intensity of the intervention in relation to the needs of the students, in this case by increasing instructional time early for the most at-risk students, we may be mediating student skill level by significantly modifying the instructional context.

Although students in the more intense intervention outperformed students in the less intense intervention, students in both interventions scored in the average range on most measures. We have yet to determine the long-term benefit of the additional instructional time. Do the differences in scores at the end of first grade afford the students in the more intense intervention a significant educational benefit in later years? A study with kindergarteners found that intensive early intervention was most beneficial for students with the lowest skills (Coyne et al., 2004). However, before committing additional resources to a more intense intervention, educators should consider the cost of providing a more intense intervention against the immediate and long-term gains of students. If student gains are maintained, the need for additional supports in later grades may be diminished or no longer necessary and this would enable students to more fully benefit from the full schooling experience. Although the challenge of providing additional support to students is difficult in early elementary, the challenge does not diminish in later grades, and success with later remediation becomes even more challenging (Vellutino et al., 2000).

Limitations and Areas Needing Further Study

This was a post hoc study, limiting direct comparisons and generalization; however, we should consider additional issues. Although students selected for this study were similarly at risk academically, there may be other contextual differences that may explain results. For example, the content of what was taught (word analysis, comprehension, and fluency) across both locations was similar for part of the year. The second half of the year, the content remained the same, but the percentage of time allocated to each component changed in the more intense intervention. The change was made in response to student need; therefore, the intervention was more responsive to student need than the less intense standard intervention. This change in the amount of time spent on different components (increased time on fluency and comprehension and decreased time on word analysis) may be more influential than the difference in total time allocation (Scarborough, 2005). In addition, on a daily basis, students in the more intense intervention had twice the amount of time to practice and extend their skills, possibly providing these students an opportunity to develop mastery in beginning sight word and word analysis skills to support greater fluency development (Engelmann, 1997). It would be interesting to follow these students into second grade to see if these higher levels of fluency were maintained or increased differentially across locations.

Second, although the use of pretest scores as covariates served to equate the groups on their pretreatment status in domains of interest (e.g., word analysis, word identification, etc.), the possibility of more qualitative group differences remains. These differences may be at the student (other skills not measured here) or school level (nature of prior or concurrent instructional experiences).
Summary

Although we are closer to understanding the complex conditions that need to be in place (time, content, group size, instructional delivery), we still have much to learn. This study examined the role of instructional time on the outcomes for the students most at risk by holding group size, setting, and instructional approach (explicit and systematic) constant. Although results need to be replicated in a controlled, direct study, in general the results imply the investment (personnel, scheduling, training, materials) is worth the outcomes of more proficient readers earlier in their schooling career. As Torgesen (2002) stated while advocating for a greater focus on intervention studies, “The cost of waiting until mid-elementary school to identify children in need of special instruction in reading is simply too great” (p. 8).

References


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