



Does Instructional Alignment Matter?

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DOES INSTRUCTIONAL ALIGNMENT MATTER?

Effects on Struggling Second Graders' Reading Achievement

ABSTRACT

The purpose of this study was to explore the effects of aligning classroom core reading instruction with the supplementary reading instruction provided to 133 struggling grade 2 readers. A 2-group, pre-posttest true experimental design was employed in this study. In 11 elementary schools, 12 teachers taught both the aligned and unaligned core and supplementary reading treatments. Students in both treatment conditions, aligned and unaligned, made statistically significant reading progress during the 20-week study. Students in the aligned reading instruction treatment group evidenced higher, statistically significant mean residual gain scores on all measures of reading at posttest. Effect sizes, favoring the aligned treatment condition, were small for all reading measures when comparing the 2 treatment groups' mean residual gain scores. This study indicates consistent advantages for aligning supplementary reading instruction with the core reading instruction provided to struggling grade 2 readers.

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TEACHING students to read has been described as the single most important responsibility of elementary schools and primary-grade teachers (Boyer, 1995). Reading research in the past 20 years has produced an emerging consensus around essential elements of beginning reading instruction, including the National Early Literacy Panel (National Institute for Literacy, 2008), the National Reading Panel (National Institute of Child Health and Human Development, 2000).

opment [NICHD], 2000), and Snow, Burns, and Griffin (1998). Findings from evidence-based reading research show measurable reductions in the incidence of reading failure when explicit instruction is provided in these essential elements of beginning reading instruction (Foorman, Francis, Fletcher, Schatschneider, & Hehta, 1998; National Institute for Literacy, 2008; NICHD, 2000; Snow et al., 1998). Ensuring that all students read on grade level by grade 3 has become a national priority as codified in the 2001 reauthorization of the Elementary and Secondary Education Act (ESEA)—No Child Left Behind (2001). Although high-quality reading instruction addressing the essential elements of beginning reading has been found to be effective, other instructional elements and conditions may be needed to support students who encounter difficulty when learning to read (Foorman & Torgesen, 2001).

Over the past decade, classroom teachers have had increased access to effective instructional practices, supported by a growing body of research evidence showing that when these practices are implemented with fidelity and diligence student reading achievement is reliably increased and incidences of reading failure are substantially reduced. Even with increased access to research evidence, the number of struggling students on state and national assessments of reading progress remains relatively stable. Results of the 2009 National Assessment of Educational Progress (NEAP) suggest some increase in the reading achievement of U.S. grade 4 students over the past decade (<http://www.nationsreportcard.gov>; National Center for Education Statistics, 2009), although the proportion of students who struggle learning to read—those reading below basic levels (>40%)—has not changed appreciably from 1993 to 2009. These results suggest that current implementation levels of evidence-based reading instruction do not appear to be sufficient on their own to accelerate struggling students' reading growth sufficiently to help them catch up with peers and maintain grade-level performance (The Nation's Report Card; National Center for Education Statistics, 2009).

Aligning Core and Supplementary Reading Programs: A Missing Link in Effective Reading Instruction for Struggling Readers?

The concept of curricular alignment has been applied to reading instructional content, practices, and design in a variety of ways over the years. For example, publishers and educators often claim that the content of published core or supplementary reading programs and the instructional practices used in classrooms are “aligned” with the scientific evidence base of reading. Thus, this application of the term *curricular alignment* means selecting reading curriculum content and instructional practices supported by the research evidence base (e.g., phonemic awareness, phonics, fluency, vocabulary, comprehension, etc.). Another way in which curricular alignment can be used is to reference the design of classroom reading instruction rather than the content. In this case, curricular alignment means carefully sequencing and pacing the curriculum content and instructional activities in two or more reading instructional programs so that they are integrated and mutually supportive. Taken together, these definitions argue not only for assuring that core and supplementary reading programs align in terms of the content as supported by the extant research evidence base, but also teaching the same set of reading skills, concepts, and strategies in a similar sequence and at a similar pace in two or more reading instruction programs.

In the routine design and delivery of supplementary reading instruction and interventions in schools, children often receive such instruction from different teachers using different programs from the program used in the traditional classroom. This often results in a lack of coherence or alignment of the content, methods, and design of supplementary and core reading instruction programs (Allington, 1994). A failure to align core and supplementary reading instruction programs can result in struggling students experiencing what amounts to two different reading curricula and interventions. In this circumstance, struggling students may expend considerable effort to learn the academic language, skills, concepts, and strategies associated with the core and the supplementary reading instructional programs. This may also lead to confusion, since students would be required to learn different reading instruction terminology, content, and skills at a different pace and in a dissimilar order (Allington & Johnston, 1986).

Add to this the fact that struggling students attending a Title I school may see several adults each day, all of whom provide reading instruction using a different instructional program in addition to the classroom core reading instruction program. Each of these supplementary reading instruction programs may present instruction from a different philosophical framework using a variety of instructional terms, sequences, strategies, materials, procedures, and pacing that differ from those found in the regular classroom core reading instruction program.

An example of how this occurs was observed on one occasion in an elementary school where the researchers had previously provided professional development and technical assistance. A reading specialist and classroom teacher met to plan how they would collaborate using a push-in intervention model where the supplementary reading teacher teaches students in the regular education classroom. The classroom teacher taught the core reading program to the whole class as the focus of Tier I reading instruction. During Tier II small-group instruction in the classroom, the school reading specialist pushed into the classroom, double dosing struggling students in small groups with a different supplementary reading program. As the classroom and supplementary reading teachers monitored their instruction, conflicts related to sequence and pacing of the skills, strategies, and concepts to be taught using the core program and the supplementary program quickly surfaced—the issue of instructional alignment. Questions arose: Should the spelling patterns taught in the core reading program match what is to be taught in the supplementary programs and vice versa? What about which sight words should be taught and how these are practiced? It also became evident that struggling students were asked to learn sight words from one word list in the classroom core reading program but were expected to learn sight words from yet another sight-word list in the supplementary reading instruction program. Even though there was some overlap between the two sight-word lists, there were also clear differences.

This observation is anything but unusual in many schools across the nation. There is often little alignment between the classroom core reading instruction program and supplementary reading instruction programs used by classroom teachers or other service providers to lift the achievement of struggling readers. Regrettably, Title I teachers, special education teachers, reading specialists, and reading interventionists who provide supplementary reading instruction to struggling readers often plan, assess, and deliver instruction in relative isolation from the students' classroom teachers, and vice versa (Johnston, Allington, & Afflerbach, 1985). Research has doc-

umented that all teachers—classroom and supplementary services teachers—are not as knowledgeable about the reading instruction students are receiving in and out of the classroom as they need to be to provide aligned instruction (Allington, 1986; Slavin, 1987; Strickland, Snow, Griffin, Burns, & McNamara, 2002).

Johnston et al. (1985) concluded that the use of multiple, unaligned reading instruction programs, core and supplementary, does not allow struggling students to learn and practice a similar set of strategies, concepts, and skills with sufficient consistency to be effective. When arguing for curricular alignment, Allington (1986) stressed the importance of alignment between what is to be taught, in what order, using which materials, and the method(s) of instruction to be used to help students learn. He argued that when two reading instructional programs are widely divergent, students can develop confused notions about the nature and purposes of reading and reading instruction. The unintended outcome of using unaligned programs of reading instruction, according to Allington (1986), shifts the burden from teachers and other instructional providers to struggling students to do the challenging work of aligning academic language as well as reading strategies, concepts, and skills between and among various reading instruction programs. The result of this can be that reading instruction provided in one setting interferes with the efficacy of reading instruction provided in another setting. Such disconnected instructional experiences can render struggling readers more rather than less confused about the nature of reading skills, strategies, and concepts, and how they are appropriately applied (Wilson-Bridgman, 1998). To effectively address the issue of fragmentation typically associated with the planning and delivery of core and supplementary reading instruction programs provided to low-achieving readers, Allington and Johnston (1986) suggested that core and supplementary reading instruction programs be more carefully aligned. They also hypothesized that this alignment might be found to be one condition of effective reading instruction for struggling students.

Others have similarly speculated that aligning reading instructional programs may hold beneficial effects for the reading achievement of struggling readers. Senacore (1987) hypothesized that aligning the curriculum and instruction methods of two or more reading instruction programs might result in struggling students receiving more consistent reading curriculum content and sufficient consecutive use of the same important reading skills, strategies, and concepts to achieve greater success in the regular classroom. By implementing aligned core and supplementary reading instruction programs to include similar program philosophies, goals, instructional sequences, instructional materials and methods, student activities, and reading skills, concept, and strategy instruction, struggling students would effectively receive a “double dose” of consistent and coherent reading instruction that is likely to result in what Downing called cognitive clarity rather than producing potential curricular confusion (1979, p. 5). When struggling readers achieve cognitive clarity about what they are learning in reading instruction, the resulting outcome may enhance their ability to learn to read more quickly and successfully. Thus, the purpose of this study was to investigate the potential achievement benefits of aligning a supplementary reading program with the classroom core reading program on the reading growth of struggling grade 2 readers. Our study was designed to answer the following research question: What is the effect of aligning supplementary and core reading instruction on struggling grade 2 students’ decoding, oral reading fluency, and comprehension of text as measured by the Woodcock Reading Mastery Test—Revised (WRMT-R;

Woodcock, 1998) and the DIBELS Oral Reading Fluency subtest (ORF; Good & Kaminski, 2002; Good et al., 2004)?

Method

Design

A two-group, pre-posttest true experimental design was employed in this study (Campbell & Stanley, 1963; Cook & Campbell, 1979; Shadish, Cook, & Campbell, 2002). The decision to deliver aligned and unaligned supplementary reading instruction for a maximum of 20 weeks was based upon a synthesis of research showing larger effects for supplementary reading instruction lasting 20 weeks or less (Elbaum, Vaughn, Hughes, & Moody, 2000; Vaughn et al., 2006).

School Settings

The study was conducted in 11 elementary schools selected purposefully from a total of 63 in a large urban school district in the Rocky Mountain West. The 11 elementary schools selected for this study met two criteria: (1) each school had met adequate yearly progress goals (AYP) in language arts, and (2) each school had participated in district-sponsored professional development trainings during 6 years of Reading First funding as authorized under the federal No Child Left Behind Act (NCLB, 2001). We employed these selection criteria to assure that the current classroom core reading instruction provided in the grade 2 classrooms at these 11 schools was reasonably successful and aligned with the reading research evidence base. The two contrasting supplementary reading instruction treatments, aligned and unaligned, were assigned in all 11 elementary schools participating in the study.

Participants

At the beginning of the study, 153 struggling grade 2 readers participated. By the end of the study 20 weeks later, there was attrition of 20 students from the total sample population. Fortunately, attrition between the aligned and unaligned treatment conditions was relatively balanced, with 9 in the aligned group ($n = 67$) and 11 in the unaligned group ($n = 66$), resulting in a total final student population of 133 struggling grade 2 readers.

The students selected for participation in the study were shown to be at significant risk for reading difficulties. These struggling grade 2 readers scored in the lowest quartile, below 30 correct words per minute, on the fall DIBELS screening assessment using the ORF subtest scores. From this pool of identified struggling grade 2 readers, students were randomly assigned using a computer-generated table of random numbers into one of two supplementary reading instruction conditions, aligned or unaligned with core reading instruction, within their respective elementary schools. In addition to core classroom reading instruction, all 133 struggling grade 2 students in the 11 elementary schools received supplementary reading instruction for approximately 80 school days or 20 weeks (range = 72–100 days) beginning in early November and continuing through late May of the academic year.

Students in both comparison treatment groups in each of the 11 elementary schools were provided daily supplementary reading instruction for 30 minutes by the

Table 1. Demographic Information

Group	<i>n</i> (%)	Male (%)	Female (%)	White (%)	Hispanic (%)	Other (%)	ELL (%)	Free Lunch (%)
Aligned	67 (50.4)	37 (55.2)	30 (44.8)	27 (40.3)	31 (46.3)	9 (13.4)	28 (45.6)	53 (79.0)
Nonaligned	66 (49.6)	36 (54.5)	30 (45.5)	30 (45.5)	30 (45.5)	6 (9.0)	33 (50.0)	54 (81.8)
Pearson chi-square		.814 ^a		.469 ^a			.528 ^a	.757 ^a

^aIndicates no significant difference, $p < .05$.

same teacher (the school reading specialist) in homogenous groups of four students. This approach to the study's design fully crossed the teacher variable with the aligned and unaligned treatment conditions rather than nesting different teachers within contrasting treatment conditions at each school. As such, assigning the reading specialist in each school to teach both supplementary reading instruction treatment conditions, aligned and unaligned, controlled by design potential teacher-by-treatment nesting effects.

Since previous research findings from Mathes et al. (2005) had already demonstrated that students who received supplementary small-group reading instruction perform significantly better than their struggling peers who receive only enhanced classroom instruction, a no-treatment control group was not used in this study for ethical and practical reasons. Rather, the unaligned reading instruction treatment group functioned as a contrast condition or group to the aligned treatment condition or group in this study.

The demographic variables of gender, ethnicity, English learner status (students with limited English proficiency), and free and reduced-price meals qualification (an indicator of low SES) for the aligned and unaligned treatment groups for the total student sample are shown in Table 1. All struggling grade 2 students, with the exception of special education students served for reading disabilities under an individualized education plan, were eligible for participation in this study.

A Pearson's chi-square was used to examine differences between the two treatment comparison groups, aligned and unaligned supplementary reading instruction, on noncontinuous demographic variables. No significant differences between the aligned and unaligned treatment groups were identified on the noncontinuous demographic variables shown in Table 1. Separate *t* tests for independent samples were conducted for the pretest, ORF raw median score, the subtest scores, and the total reading standard scores on the WRMT-R (Woodcock, 1998). The use of standard scores provided an indication of the students' below-average level in total reading ability. There was no significant difference between the aligned and unaligned treatment groups on these pretest measures of reading achievement (see Table 2).

Supplementary Reading Program Selection

The selection of the supplementary reading program was made by school district leadership prior to the design and onset of this study. The district decision to adopt the Read Well program was based upon preliminary evidence from the Florida Center for Reading Research indicating that "the instructional content and design of *Read Well* is consistent with the most recent research in reading. These studies demonstrate that exposure to *Read Well K* and *Read Well 1* increase student performance

Table 2. Group Comparison on Pretest Measures

Dependent Variable	Aligned Treatment (<i>n</i> = 65)		Unaligned Treatment (<i>n</i> = 68)		<i>t</i>	<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Oral reading fluency	13.43	6.78	13.38	7.10	.040	.968
Word identification (SS)	92.25	8.00	90.91	6.88	1.033	.304
Word attack (SS)	97.15	9.21	95.07	8.50	1.355	.178
Word comprehension (SS)	88.00	8.86	88.33	8.49	-.225	.822
Passage comprehension (SS)	87.46	7.76	87.32	8.27	.099	.921

Note.—SS = standard score.

on reading and language standardized test scores” (Wahl, 2007, p. 6). Thus the decision to adopt Read Well was not ours. However, by using what had already been decided as the district’s programmatic approach to supplementary reading instruction, in which an unaligned supplementary program was essentially layered on top of the district’s adopted core reading instruction program, provided an ecologically valid context for examining a typical approach used in school settings to provide struggling readers with supplementary reading instruction.

Instrumentation

Two instruments were used in this study. The first was the DIBELS ORF subtest. The score obtained for this measure was the median score for reading 3-second grade-level passages for 1 minute each. Evidence of technical adequacy for ORF scores (reliability and validity) is drawn from a series of studies based on the CBM reading procedures in general (Good & Kaminski, 2002). Test-retest reliabilities for elementary students ranged from .92 to .97; alternate-form reliability of different reading passages drawn from the same level ranged from .89 to .94 (Tindal, Marston, & Deno, 1983). In addition, criterion-related validity studied in eight separate studies in the past 2 decades ranged from .52 to .91 (Good & Jefferson, 1988; Good, Simmons, & Kame’enui, 2001).

The second instrument used in this study was the WRMT-R, Forms G (pretest) and H (posttest) (Woodcock, 1998). The WRMT-R subtests used in this study were word identification, word attack, and reading comprehension. The word attack subtest of the WRMT-R evaluates students’ ability to pronounce pseudowords. WRMT-R word attack subtest score split-half and test-retest reliabilities are .94 and .97 for grade 1 and .91 and .95 for grade 3, respectively. The word identification subtest of the WRMT-R measures students’ ability to read real words. WRMT-R word identification subtest score split-half and test-retest reliabilities are .98 and .99 for grade 1 and .97 and .99 for grade 3. The reading comprehension score used in this study was a composite score derived from combining scores on the word and passage comprehension subtests of the WRMT-R, Form G (Woodcock, 1998). Split-half and test-retest reliabilities for WRMT-R word comprehension subtest scores are .95 and .98 for grade 1 and .91 and .95 for grade 3. The passage comprehension test is a cloze measure for which students silently read sentences and supply missing words. Split-half and test-retest reliabilities for the WRMT-R passage comprehension subtest scores are .94 and .97 for grade 1 and .92 and .96 for grade 3. Concurrent validity estimates for the subtests of the WRMT-R range from .63 to .82 when

compared to the Total Reading Score of the Woodcock-Johnson Psycho-Educational Battery (Woodcock & Johnson, 1977). The WRMT-R reliability and validity estimates are reported to be .99 in grade 1 and .98 in grade 3 for the normative update total reading full scale (Woodcock, 1998).

Assessment Procedures

District literacy coaches were provided training in test administration procedures for the DIBELS and WRMT-R measures in a three-step process prior to the study. First, a basic orientation to the assessment procedures was provided. Administrative guidelines in the DIBELS and WRMT-R manuals were strictly adhered to. Second, district literacy coaches were asked to practice with nontreatment students and bring completed DIBELS and WRMT-R protocols to subsequent training sessions. Each district literacy coach was observed giving the DIBELS ORF and the WRMT-R subtests used in this study. Finally, DIBELS and WRMT-R protocols were reviewed for accuracy in marking responses as well as understanding of the ceiling and floor of the test. District literacy coaches with any errors were asked to review the protocols and/or assessment subtests and were observed again to ensure accuracy of test administration. Both the DIBELS ORF and the WRMT-R subtests were administered by the district literacy coaches within a 2-week testing window prior to and following the intervention period (Good & Kaminski, 2002; Woodcock, 1998).

Preparing the School-Level Reading Specialists for Participation in the Study

Twelve school-level reading specialists in 11 elementary schools provided daily 30-minute supplementary reading instruction to participating struggling grade 2 students in small groups of four for 20 weeks in both comparison treatment conditions. Reading specialists were experienced primary-grade teachers with more than 5 years of elementary teaching, possessed extensive graduate-level training for serving struggling students, and either held or were actively working toward a state-issued Reading Endorsement Level 1 (Reading Teacher) and Level 2 (Reading Specialist).

Before the study began, participating reading specialists received 28 hours of professional development in instructional procedures needed to teach both the aligned and unaligned core and supplementary reading instruction program treatment conditions. The reading specialists were trained to use the Read Well program (Sopris West). The process of aligning the scope and sequences of the core and supplementary programs of instruction required approximately 42 hours of additional professional development and group planning time. During the 20-week study, reading specialists participated in monthly training meetings where they discussed issues regarding the implementation of the aligned and unaligned treatment conditions. At these meetings, reading specialists also shared data and effective instructional strategies for students not accelerating as quickly as desired.

Core and Supplementary Reading Instruction Treatment Conditions: Aligned and Unaligned

The goal of providing aligned supplementary reading instruction was to provide struggling grade 2 students sufficient intensity, consistency, and practice of reading skills, strategies, and concepts taught in classroom core reading instruction in order

for them to master these. All struggling grade 2 students assigned to both treatments received daily classroom core reading instruction following the district-adopted core reading programs' scope and sequence of instruction. Both treatments provided struggling readers access to reading instruction in all five essential elements of reading identified by the National Reading Panel (NICHD, 2000). Thus, the major point of contrast between the two treatment groups focused on aligning instruction to match the scope, sequence, and pacing of the core classroom reading instruction program rather than focusing on an alignment of reading program content with the evidence base. A comprehensive comparison of the three scopes and sequences of instruction (the classroom core reading program, Read Well, and the aligned supplementary reading program) developed for the study would have required the publication of a very lengthy appendix with this article. Table 3 was developed to present a sample comparison of the classroom core reading program scope and sequence, the Read Well program scope and sequence, and the aligned supplementary reading instruction treatment group's scope and sequence of instruction as implemented in this study.

The unaligned supplementary reading instruction treatment in this study used the scope and sequence of skills as specified by the designers of the Read Well program (Sprick, Howard, & Fidanque, 1998). Table 3 shows how the Read Well program's scope and sequence of instruction, as published and implemented in this district, differed from the scope and sequence of instruction in the classroom core reading program. Table 3 also shows how the supplementary reading instruction provided to struggling grade 2 students in the aligned treatment group was specifically designed by the school-based reading specialists to match the core reading program's scope, sequence, and pacing of instruction.

Contrasting the Treatment Condition Instructional Procedures

The contrast between the aligned and unaligned treatment conditions was clearly demonstrated in how well the phonics, fluency, vocabulary, and comprehension instruction provided to struggling grade 2 students mapped onto the instruction provided in the core classroom reading instruction program. In what follows, we describe the contrast between the aligned and unaligned treatment group's supplementary programs of instruction.

For the first 15 minutes of daily supplementary reading instruction in both treatment groups, struggling students in grade 2 were taught word-level reading skills using a synthetic phonics approach either matched to or differing from the sequence and pace of instruction in the classroom core reading program. Students in both treatment groups identified as lacking phonological processing skills were taught a series of phonemic awareness skills for 2–3 minutes daily until oral blending and segmentation skills were established. There was no provision for phonemic awareness instruction in the district's adopted grade 2 core reading program.

Both treatment conditions presented phonics instruction explicitly, systematically, and synthetically. Table 3 shows, however, that the core classroom reading instruction program specified that short vowels were to be taught first. In the unaligned treatment group, the scope and sequence of the Read Well program specified that a mixture of long and short vowels were to be taught first, resulting in a mismatch with the scope and sequence of the core classroom reading program. In con-

Table 3. Comparison of Aligned and Unaligned (Read Well) Supplementary Interventions: Sample Scope and Sequence of Instruction

Instructional Delivery	Classroom Core Program	Treatment 1: Aligned Supplementary Instruction	Treatment 2: Unaligned Supplementary Instruction
Decoding practice: word study (15 minutes per lesson):			
Phonological processing	Not included	Oral blending and segmentation: syllables, initial consonant sounds, final consonant sounds, three phonemes Short vowels: /a/, /i/, /o/, /u/ R controlled: /ar/, /er/ spelled er, ir, ur Long A: a, a_e, al_, _ay Long E: e, e_e, ee, ea _y, and _ie_ Long I: i, i_e, _ie, _y, igh Long O: o_e, _oe, oa_, _ow	Read Well: rhyming, alliteration, stretch and shrink words, identification of beginning and ending sound Long e spelled e, ee Short vowels: /a/, /i/ Long E: ea Vowel diphthong: oo Long A: a_e R controlled: ar Short vowel: /e/ Long I: _y Long O: /o/, o_e Short U: /u/ moon, room, week, trick, scat, scoot Theme: the lagoon; crab, raccoon, lagoon
Sample words for blending Vocabulary	wife, wives; elf, elves; shelf, shelves Theme: kindness; leather, polished, cobbler	dime, life, widest, tried Theme: kindness; frightened, tiny, wide	
Fluency in connected text and comprehension (15 minutes per lesson): Fluency in connected text	Decodable text: <i>The Overholds</i>	Decodable text: <i>Spice Cake, Dean's Pies, Why Bly?</i> <i>The Lion and the Mouse</i> (2-page selection)	Decodable text: <i>See the Raccoon</i>
Comprehension	<i>The Elves and the Shoemaker</i> (anthology selection) Strategy: asking questions, clarifying, predicting Graphic organizer: plot line	Strategy: asking questions, clarifying, predicting Graphic organizer: plot line	<i>Creatures of the Lagoon</i> (4-page selection) Strategy: inferring, identifying, comparing Graphic organizer: student-drawn picture of the sea with a crab, inferring details from text

trast, in the aligned supplementary reading instruction treatment group, phonics instruction was matched to the instructional sequence and pacing of skills, concepts, and strategies taught in the classroom core reading instruction program by beginning instruction with short vowel sounds (see Table 3). Thus, students in the unaligned treatment group were explicitly taught phonics skills using the order of the lessons and skills as prescribed and published in the Read Well program. However, in the aligned treatment group, reading specialists had prepared specific explicit instruction phonics lessons targeted to map onto the phonics lessons taught in the classroom core reading program.

Lesson activities in the aligned supplementary reading instruction treatment group were designed to reinforce classroom core reading instruction content, delivery, method, sequence, and pacing. Consequently, reading specialists explicitly taught the same phonic concepts using the same methods as those used during classroom core reading instruction, for example, teaching blending by writing spellings on a whiteboard as students read, or teaching segmentation in spelling through dictation lessons. “Toughie Charts” also used in the classroom core instruction, containing lines of practice with spellings, words, phrases, and sentences, were used in the aligned supplementary reading instruction treatment group. Similarly, the same spellings, words, and phrases used in the classroom core reading program written on sentence strips were read in the aligned supplementary reading instruction treatment group. While there was little flexibility provided in what to teach because all supplementary instruction was designed to practice skills, concepts, and strategies aligned with the scope and sequence of classroom core reading instruction, reading specialists used their knowledge and expertise from reading endorsement courses and district professional development to adjust specific teaching activities to the needs of the students so long as fidelity to the scope and sequence of classroom core reading instruction was maintained.

The second 15 minutes of daily supplementary reading instruction provided practice in reading connected texts to develop oral reading fluency, vocabulary, and comprehension skills. Repeated oral readings using decodable and other text selections were the central focus of the second 15 minutes of daily instruction. For example, in the unaligned treatment condition, struggling grade 2 students were provided with a variety of controlled, decodable texts using sounds and spellings as taught in Read Well. Because phonics sounds and spellings were taught and practiced in a different sequence than those taught in classroom core reading instruction, students in the unaligned treatment group practiced reading controlled, decodable texts that did not match the phonics elements taught in the classroom core reading program. In contrast, in the aligned treatment condition, fluency practice using word lists and additional connected text readings to support the phonics instruction provided was selected and tightly controlled for the specific spellings and phonic elements taught in the classroom (see Table 3). Similarly, word families taught in the aligned treatment group used the specific word families taught in the classroom.

As previously mentioned, the second 15 minutes of daily aligned and unaligned supplementary reading instruction also included explicit vocabulary and comprehension instruction. In the unaligned treatment condition, vocabulary instruction was provided on three keywords that would be read in a later reading selection as dictated in the scope and sequence of Read Well. However, the vocabulary words to be taught in the reading selection in the unaligned treatment

group did not match the theme of the core reading program selection (see the example lesson in Table 3). Pictures of key vocabulary words were presented with child-friendly definitions. To support the reading specialists in providing vocabulary instruction, a picture library and definitions were provided by district literacy staff. The unaligned treatment group's comprehension instruction made use of explicit comprehension strategy instruction (i.e., visualizing, making connections) including text structure instruction using graphic organizers. However, the text selections read in the unaligned treatment group did not match the theme of the main reading selection in the classroom core reading instruction program (any connection between the vocabulary words and comprehension strategies taught and/or graphic organizers used in instruction and the core reading program in the unaligned treatment group was coincidental and infrequent). After providing vocabulary and comprehension instruction as described, students in the unaligned treatment group repeatedly read controlled texts aloud while the teacher read noncontrolled texts aloud in a duet story as prescribed in the Read Well program.

For the aligned supplementary reading instruction treatment group's vocabulary and comprehension instruction, the reading specialists had chosen vocabulary words and a text that mirrored the theme and content of the major reading selection students had been reading in their classroom core reading instruction program (see Table 3). As part of the aligned vocabulary lessons, pictures and student-friendly definitions were presented for theme-related words, engaging students in learning content words similar to those in meaning found in the core classroom reading program. Pictures of these vocabulary words were presented with child-friendly definitions. To support the reading specialists in providing this instruction, a picture library and definitions were provided by district literacy staff.

Comprehension strategies taught in the aligned supplementary instruction treatment group mirrored the strategies being taught in the classroom core reading program. For example, students might be learning to visualize and ask questions as they read a text about wildlife in the core classroom, or they might complete a Venn diagram comparing and contrasting two wild animals. During the aligned supplementary reading instruction lesson, reading specialists promoted application of the same comprehension strategies using supplementary texts selected from those supplied in the core reading program that mirrored the content and themes of the main core reading program selection (see Table 3). As students read a new text related to the main core reading program selection in aligned small-group supplementary reading instruction, they practiced applying the same visualizing skills, asking questions or completing a Venn diagram to compare and contrast the animals or characters in the new selection as they had in the main core reading program text selection.

In summary, the aligned and unaligned supplementary reading instruction in this study provided students access to instruction in all five essential elements of reading identified by the National Reading Panel (NICHD, 2000). Thus both the unaligned and aligned supplementary reading instruction treatment groups received instruction that was aligned with the evidence base available at the time. Thus, the major difference in this study between the treatment groups was the degree to which the sequence and pacing of supplementary reading instruction either matched or differed from the sequence and pacing of the classroom core reading instruction program.

Fidelity of Implementation

In order to ensure that contrasting treatment conditions were conducted as described, six district-level literacy coaches and one investigator conducted unannounced bimonthly fidelity checks using a three-point scale—evident (3), emerging (2), and not evident (1). Interrater reliability was established at .91 between one investigator and the six literacy coaches prior to conducting 70 fidelity checks for each treatment.

A two-point rating scale, yes (2) or no (1), was also used to evaluate the quality of implementation of each activity within each observed lesson across four categories: (a) appropriate content, (b) brisk pacing, (c) implementation of prescribed procedures within prescribed time frames, and (d) behavior management. Overall, the fidelity of implementation for both treatments was very high (quality scores above 1.5 out of 2). Mean score evaluations of all observations ranged from 1.74 to 1.8.

Analyses

Posttest data were analyzed by contrasting the aligned and unaligned treatment groups' mean residual gain standard scores on the WRMT-R subtests and the mean residual gain raw scores on the DIBELS ORF subtest from pre- to posttesting. Each of the posttest WRMT-R subtest standard scores and ORF subtest raw scores were analyzed with separate ANCOVA analyses using SPSS v. 15. Separate ANCOVA analyses with the relevant pretest standard or raw score serving as the covariate in the analysis were performed to determine differences between the two treatment conditions

ANCOVA was selected to increase statistical power for detecting treatment differences. Lomax (2004) asserted that separate univariate analyses (ANCOVA) are a preferred approach over the use of a single multivariate analysis (MANCOVA) because such an approach allows the inspection of treatment effects for each dependent variable. Preliminary analyses were conducted to test the assumptions typically associated with the use of analysis of covariance (ANCOVA): normality, homogeneity of variances, and linearity. To control for the potential problem of false discovery rate (FDR), a Bonferroni's adjustment of the alpha level was used for any statistically significant finding (Benjamini & Hochberg, 1995). Alpha was set at $p < .0125$ by dividing .05 by 4, which represented the total number of statistical tests conducted on the same population. An eta-squared effect size was calculated for each of the measures. An effect size of .2 is considered to be a small effect, .5 a moderate effect, and .8 a large effect (Cohen, 2001).

Potential clustering effects associated with teacher \times treatment interactions (teacher nested within treatments) were controlled by design, since teachers were fully crossed with both treatments in all 11 elementary schools. Also, because students who participated in the aligned and unaligned treatment conditions were from different classes and schools, and the intervention was not conducted at the classroom level, it was not expected that the clustering of students within classes or schools would have an impact on the findings. Consequently, it was unnecessary to use a multilevel model to control for nesting or clustering effects when assessing differences between the contrasting treatment groups.

Table 4. Posttest Means, Standard Deviations, and Effect Sizes for Reading Fluency, Word Identification, Word Attack, and Reading Comprehension by Contrasting Treatment Groups

	Aligned Treatment		Unaligned Treatment		<i>F</i> Test ^a	<i>p</i> Value ^b	Eta-Squared Effect Size
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			
Oral Reading Fluency (ORF): Posttest (raw scores in wcpm)	40.87	20.32	38.92	20.99	10.64	<.001	.17
Woodcock Reading Mastery—R (subtest scores in standard scores):							
Word identification	94.25	9.07	93.04	7.79	4.73	<.011	.08
Word attack	100.41	11.11	99.04	9.27	8.14	<.001	.13
Reading comprehension	92.08	8.59	90.82	7.83	11.57	<.001	.18

^a Degrees of freedom of *F* test = 140.

^b Bonferroni's corrected alpha set at $p < .0125$.

Results

Struggling readers in both the aligned and unaligned supplementary reading instruction groups made significant growth across all measures from pretest to posttest during the treatment period. The principal point of interest of this study, however, focused on investigating differences between the effects of the aligned and unaligned supplementary reading instruction treatments. The median raw scores of the DIBELS ORF subtest were used to measure students' oral reading fluency. The results of this ANCOVA indicated a statistically significant difference between the aligned and unaligned conditions' mean residual gain median raw scores on the DIBELS ORF assessment (see Table 4). The eta-squared effect size for ORF scores indicated a small but statistically significant positive effect of aligning supplementary reading instruction on students' growth in oral reading fluency.

Standard scores for the WRMT-R word identification subtest were used in the analysis. The results of this ANCOVA indicated a statistically significant difference between the aligned and unaligned supplementary reading instruction treatment groups' mean residual gain standard scores on the WRMT-R word identification subtest (see Table 4). The eta-squared effect size for the WRMT-R word identification treatment effect indicated a small but statistically significant positive effect of aligning supplementary reading instruction on students' ability to recognize high-frequency sight words.

Standard scores for the WRMT-R word attack subtest were used in the analysis. An ANCOVA indicated a significant difference between the aligned and unaligned supplementary reading instruction treatment groups' mean residual gain standard scores on the WRMT-R word attack subtest (see Table 4). The eta-squared effect size for the WRMT-R word attack subtest scores indicated that providing aligned reading instruction had a small but statistically significant positive effect of aligning supplementary reading instruction on students' ability to decode increasingly difficult words using phonics.

The WRMT-R reading comprehension standard composite score, which was derived from the vocabulary and comprehension subtest standard scores, was used to measure students' reading comprehension in the analysis. An ANCOVA indicated a statistically significant difference between the aligned and unaligned supplementary reading instruction treatment groups' mean residual gain standard composite reading comprehension scores (see Table 4). The eta-squared effect size for reading comprehension indicated that providing aligned supplementary reading instruction had a small but statistically significant positive effect on students' WRMT-R reading comprehension scores.

Discussion

Providing the highest-quality classroom and supplementary reading instruction for struggling students is a central focus of current educational research. With the advent of the No Child Left Behind Act (2001) and increasing use of Response to Intervention (RTI) models in classrooms and schools, the urgency of identifying effective instructional practices to help struggling readers succeed has also increased. Much of the research in education, both past and contemporary, has focused on a comparison of one instruction method or intervention to another. Such studies identified instructional practices that were more or less effective than others.

In this study, the focus was not upon comparing different interventions to one another but rather comparing the effects of aligned and unaligned core and supplementary reading programs on the reading growth of struggling grade 2 students. The goal of aligning supplementary reading instruction was to be able to provide struggling grade 2 students with sufficient intensity, consistency, and practice of the reading skills, strategies, and concepts taught in classroom core reading instruction. Because the aligned and unaligned supplementary reading instruction treatment groups were provided access to comprehensive core and supplementary reading instruction in all five essential elements of the reading as identified by the National Reading Panel (NICHD, 2000), the focus of this study was upon investigating the effects of aligning the sequence and pacing of supplementary reading instruction to match the classroom core reading instruction program. In the end, statistically significant differences were identified in favor of the aligned supplementary reading instruction comparison group in all areas of measured growth: decoding, fluency, and comprehension. As a result, this study demonstrates that aligning the sequence and pacing of skills, strategies, and concepts taught in supplementary reading instruction with the sequence and pacing of skills, strategies, and concepts taught in classroom core reading instruction provided consistent measurable benefits for struggling grade 2 students in decoding, fluency, and reading comprehension as measured by the DIBELS ORF subtest and several subtests of the WRMT-R.

Decoding

Struggling grade 2 students' decoding abilities were positively affected by aligning the decoding instruction scope and sequence of strategies and concepts in supplementary reading instruction with the scope and sequence of skills, strategies, and concepts in classroom core reading instruction as measured by the word attack and word identification subtests of the WRMT-R. Students in both reading instruction

treatment conditions were exposed to systematic, explicit phonics instruction and follow-up readings of decodable texts. A significant difference between the two treatment conditions was that the aligned treatment condition provided follow-up instruction on and readings of decodable books that were connected to the phonics patterns presented in classroom core reading instruction. By receiving additional guided practice and the reading of decodable texts that aligned with the phonics patterns and content of classroom core reading instruction, the aligned reading instruction treatment provided additional teacher-guided practice with recently taught phonics patterns as students encountered these in a variety of overlapping contexts both in instruction and in texts. Thus, the additional phonics instruction on patterns taught in the classroom coupled with additional teacher-guided practice of these phonics patterns during the repeated readings of multiple decodable books may explain the significant difference in struggling grade 2 students' decoding ability favoring students in the aligned treatment condition.

Reading Fluency

Students in both reading instruction treatment conditions engaged in repeated readings of a variety of texts to improve fluency. The primary difference between the two reading instruction treatment conditions was that the aligned treatment condition provided repeated reading of books that aligned with the content of classroom core reading instruction, containing phonics patterns and comprehension themes that had been previously taught in classroom reading instruction. This difference explains, at least partially, the significant difference in struggling grade 2 students' reading fluency posttest scores on the DIBELS ORF subtest favoring the aligned treatment condition.

Reading Comprehension

Similarly, struggling grade 2 students' comprehension abilities were also positively affected by aligning the vocabulary and comprehension instruction scope and sequence of skills, strategies, and concepts in supplementary reading instruction with the scope and sequence of skills, strategies, and concepts in classroom core reading instruction as measured by a comprehension subscore that combined the vocabulary and comprehension subtest scores of the WRMT-R. Students in both the aligned and unaligned reading instruction treatment conditions received vocabulary and comprehension instruction using vocabulary lessons, "think alouds," questions, and graphic organizers to develop an understanding of individual word meanings and the texts they were reading. Once again, the major difference was that the aligned treatment condition provided struggling readers additional, related instruction and teacher-guided practice during supplementary reading instruction using the same vocabulary word meanings and comprehension skills, strategies, and themes that were presented in classroom core reading instruction. By reading additional texts that aligned with the theme and content of classroom core vocabulary and comprehension instruction, the aligned supplementary reading instruction treatment provided extended modeling and guided practice as students read previously taught vocabulary words in the core program texts and applied these comprehension skills and strategies with a variety of thematically related additional texts. This consistency of text themes, additional repeated exposures to vocabulary word meanings and com-

prehension strategy instruction, and guided practice in the aligned condition may partially explain the significant difference in combined WRMT-R reading comprehension scores favoring students in the aligned treatment condition. It is also interesting to note that the strongest effect size found in this study was obtained in the area of reading comprehension, which combined both passage and vocabulary comprehension scores on the WRMT-R (.18). The results of this study indicate that aligning vocabulary and comprehension supplementary reading instruction with the scope and sequence and pacing of the classroom core reading program had consistent, beneficial effects on the vocabulary and comprehension growth of struggling grade 2 students.

Accelerating Student Growth in Reading

Torgesen (2004) argued that a strong science of reading requires research that focuses on the conditions that bring the reading skills of struggling students into the typical range; once students fall behind, research should focus upon the instructional interventions that are likely to accelerate students' reading growth. In essence, intervention research questions in reading would change from which methods are most effective to which methods are most effective for moving struggling students into the normal range of reading performance.

One way to determine when struggling students have moved into the normal range of reading performance, according to Torgesen (2004), is to note when struggling students' reading achievement scores exceed the 30th percentile on standardized reading tests. Performance below the 30th percentile is an indicator of struggling readers who will likely need additional/ongoing intervention services, but once students exceed this benchmark they are in less danger of reading failure (Al Otaiba & Fuchs, 2002). Similarly, Mathes et al. (2005), in reporting rates of student response to Tier I and Tier II interventions, used a cut point of performance below the 30th percentile on the Woodcock Johnson III Basic Reading Skills cluster to denote inadequate response to intervention (Woodcock, McGrew, & Mather, 2001).

In our study, the percentage of struggling students scoring above the 30th percentile at posttest ranged from 41% on passage comprehension to 81% on word attack. Using the 30th percentile on the WRMT-R III total reading composite score as a benchmark of success, 60% of students in the aligned treatment condition scored above the 30th percentile, with 56% of students in the unaligned treatment condition scoring above the 30th percentile. Most interestingly, the same proportion of students, 60%, in the aligned reading instruction treatment group also scored above the 40th and 50th percentiles. However, the proportion of students in the unaligned treatment group scoring above the 40th and 50th percentile level declined from 56% at the 30th percentile level to below 50%.

Taken together, the findings of our study form a consistent pattern of results that suggest supplementary reading instruction, whether aligned or unaligned, results in increased reading achievement for struggling grade 2 students, similar to past studies of struggling readers. However, our study provides new evidence suggesting added value for aligning core and supplementary reading instruction. The results of our study suggest that providing struggling students with supplementary reading instruction that is aligned with classroom core reading instruction is more effective for helping struggling students achieve growth in reading than is the typical "layered on top of" or unaligned supplementary and classroom core reading instruction. Stated

another way, these findings suggest that struggling students benefit from an increased degree of fit among instructional objectives, academic language, content, skills, strategies, concepts, sequence, pacing, and so on, such that the content of supplementary reading instruction mirrors the scope and sequence of the core classroom reading instruction. Aligned reading instruction, as investigated in this study, results in a high focus on meeting individual student needs through increasing instructional intensity and providing struggling students a double dose of consistent and coherent reading instruction that increases instructional time—all of which have been shown to lead to increased student reading achievement.

The findings of our study provide converging evidence that, as Allington (1986) hypothesized years ago, struggling students may benefit from supplementary reading instruction that is congruent or aligned with classroom reading instruction. Aligning classroom core and supplementary reading instruction works to overcome the typical fragmentation of reading instruction in which students are taught with different curricula, academic terms, content, objectives, scopes and sequences, and instructional pacing. Allington (1986) cautions that one potential and unintended outcome of unaligned programs of reading instruction is that the burden is shifted from teachers to struggling students to do the challenging work of aligning academic language as well as the reading strategies, concepts, and skills taught among various reading instruction programs. Thus, aligning supplemental reading instruction with classroom core reading instruction programs locates the primary responsibility for the progress of struggling readers with teachers rather than with students. Aligned reading instruction also creates bridges for struggling students by allowing them to thoroughly learn and practice a consistent set of reading skills, strategies, and concepts with enough consecutive repetitions to be effective.

Limitations

The findings of this study are limited to the sample population of struggling grade 2 readers and school-level reading specialists who participated in the study. Care should be taken not to overgeneralize our findings beyond the specific population. The supplementary instruction in this study was delivered by highly trained reading specialists. The results may not be the same when tutors, parents, aides, paraprofessionals, or others provide supplementary reading instruction, aligned or unaligned. Our results should not be generalized beyond the curriculum and the instructional programs used in this study to examine the potential value added of the aligned and unaligned reading instruction conditions. One cannot conclude with confidence that the use of other core reading instructional programs in combination with other available supplementary programs would necessarily result in similar outcomes to those found in this study.

Implications

Future research might investigate aligning “nationally validated” programs, such as those found on the What Works Clearinghouse Web site, both core and supplementary, to determine if doing so increases the effect sizes for aligning core and supplementary reading programs upon the reading growth of struggling readers as found in this study. Obviously, future research might also concentrate on how or whether

alignment of instructional programs in reading affects students at differing grade levels or levels of reading development.

Exploring whether aligning reading instructional programs offered by less-trained individuals would have the same salutary effects on struggling readers as found in our study would provide additional information beyond our scope. An examination of the effectiveness of aligning reading instruction between classroom content literacy instruction and small-group supplementary instructional services for struggling intermediate-age students may provide insight into ways to effectively integrate content-area literacy instruction with special, supplementary services provided to struggling readers in intermediate elementary grades and in secondary classrooms.

Finally, there remains some debate as to whether or not the NRP has identified all or most of the effective instructional practices to accelerate the development of struggling students' reading acquisition. Our study focused instruction on the five essential elements of reading instruction identified by the National Reading Panel (NICHD, 2000). It may be that there are more, less, or different reading instructional elements needed to accelerate the learning of struggling readers, such as those recently published in the National Early Literacy Panel Report (National Institute for Literacy, 2008). Future research also needs to address questions of instructional intensity and differing combinations of instructional content, sequence, and pacing.

In summary, this study points to small but consistent advantages for aligning supplementary reading instruction with the classroom core reading instruction provided to struggling grade 2 readers. To do so requires significant collaboration of classroom teachers and other school service providers to unify the educational experiences of students learning to read. From the results of this study it appears that doing so has beneficial effects on struggling grade 2 readers' early growth in reading that is worth the effort.

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