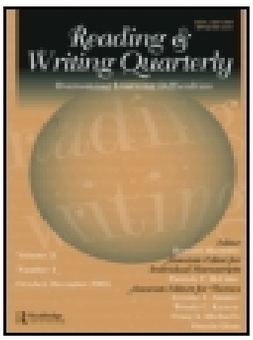

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# Reading Instruction for Fourth-Grade Struggling Readers and the Relation to Student Outcomes

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**ABSTRACT**

The present study examined the amount, type, and quality of Tier 1 and supplemental reading instruction provided to 4th-grade struggling readers and whether specific elements of instruction predicted growth in reading skills. In all, 110 students identified as having reading difficulty who were receiving school-based reading instruction in 22 classrooms located in 2 states/sites participated. We observed and coded reading instruction for instructional dimensions, including reading components, grouping, and quality. Reading comprehension and vocabulary were the most prevalent components of instruction, whereas limited time was allocated to word-level reading skills. We noted several significant differences in time allocated to overall instruction and components of instruction during Tier 1 between sites. Overall, there were few unique Tier 1 instructional predictors of student achievement at the end of the year. Students receiving supplemental reading instruction outperformed those students receiving only Tier 1 on measures of oral reading fluency. We discuss implications for instruction and future research.

The transition from the early to the upper elementary grades includes a shift in reading instruction marked by a reduced focus on foundational skills and a continued and increased emphasis on the application of these skills to the successful reading, analysis, and comprehension of increasingly difficult literature and informational texts (Common Core State Standards Initiative [CCCS], 2010). Despite well-documented research supporting the efficacy of early identification and intervention for preventing and ameliorating reading difficulties in the early grades (e.g., Denton, Fletcher, Anthony, & Francis, 2006; Fletcher, Lyon, Fuchs, & Barnes, 2007), many students are not able to successfully meet the increasing demands encountered in the upper elementary grades. A recent national assessment indicated that just over one third (36%) of all fourth graders demonstrate proficient reading skills (National Assessment of Educational Progress; U.S. Department of Education, 2015); nearly another third of the nation's fourth-grade students failed to perform at even a basic level of reading. Furthermore, rates of identification for special education eligibility increase significantly beyond third grade (Blackorby et al., 2010).

Research has demonstrated that students who struggle with the acquisition of key reading skills are very likely to exhibit continued difficulty into the late elementary and secondary grades (e.g., Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996; Juel, 1988; Phillips, Norris, Osmond, & Maynard, 2002). Thus, many students with reading difficulties in fourth grade may have longstanding difficulties that were not sufficiently remediated, whereas others may be exhibiting late emerging reading problems (e.g., Leach, Scarborough, & Rescorla, 2003). That is, despite exhibiting adequate decoding and fluency in the early grades, they lack sufficient vocabulary knowledge and comprehension

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strategies when faced with increasingly difficult text. Regardless of the cause, for nearly three quarters of students who enter the upper elementary grades with reading difficulty, these difficulties are likely to persist into the middle and high school years (Francis et al., 1996). Coupled with current reading achievement at this level, this highlights the vital need to examine factors influencing reading outcomes for those students who enter the upper elementary grades with demonstrated reading difficulties. In the present study, we sought to explicitly investigate instructional variables and their impact on reading outcomes for a group of fourth-grade students with reading difficulties.

## Addressing reading difficulties with response to intervention (RtI)

With the goal of reducing inappropriate special education referrals and placements and increasing the focus on high-quality instruction, RtI models have become a primary means of addressing the reading difficulties of students with demonstrated risk of poor reading outcomes (Lembke, McMaster, & Stecker, 2010). As an educational service delivery model, RtI is grounded in empirical literature integrating research, practice, and policy (Justice, 2006). In the decade since the reauthorization of the Individuals with Disabilities Education Act (2004) and the resulting emergence of RtI, such processes are now ubiquitous in schools across the country, with 45 states having specific guidance documents on the use of RtI (Hauerwas, Brown, & Scott, 2013).

The primary feature of RtI is the provision of tiered or layered instruction guided by a data-based decision-making process (Johnson, Mellard, Fuchs, & McKnight, 2006). Tier 1, or core reading instruction, represents a critical first line of defense in preventing and/or ameliorating reading difficulties and thus should be able to meet the needs of most students (Fuchs, Fuchs, & Stecker, 2010; Vaughn, Wanzek, & Fletcher, 2007). However, Tier 1 instruction should also be differentiated in order to address the reading difficulties some students may exhibit and may include flexible instructional groupings and/or focus on specific components of reading to meet student needs (Vaughn, Wanzek, Woodruff, & Linan-Thompson, 2007). Recent intervention research suggests that 20% to 30% of students may require additional instruction beyond Tier 1 (e.g., O'Connor, Bocian, Beach, Sanchez, & Flynn, 2013; Ritchey et al., 2012). Tier 2 involves the provision of supplemental reading instruction within small homogeneous groups targeting areas of specific need, allowing more opportunities for practicing specific skills while receiving frequent feedback and support (Gersten et al., 2009). Gersten et al. (2009) highlighted the fairly strong evidence for Tier 2 interventions providing intensive, systematic instruction on up to three foundational skills within small groups that meet 3–5 times weekly for 20–40 min. For those students unresponsive to Tier 2 supplemental instruction, intervention is further intensified via a smaller group size; increased time and duration of intervention; and/or a more explicit, systematic instructional focus (Vaughn, Denton, & Fletcher, 2010). This level of support (i.e., Tier 3) may include special education and related services. However, it has been estimated that in a collaborative, multitiered system of instruction in which students with reading difficulties are afforded the necessary core reading instruction and supplemental instruction/intervention, less than 5% of students will continue to exhibit reading difficulty that requires the most intensive levels of intervention in order to remediate (Torgesen, 2000).

To date, there exists modest support for the efficacy of RtI or multitiered models of service delivery in the research literature. An early meta-analysis (Burns, Appleton, & Stehouwer, 2005) of large-scale regional and statewide applications of problem-solving models found moderate effects on student achievement (effect size [ES] $= 0.62$) and a strong effect on reduction in special education referrals (ES $= 1.73$). In general, research on the implementation of RtI within the elementary school setting has demonstrated increased student reading achievement and/or reductions in students identified as learning disabled (e.g., Bollman, Silberglitt, & Gibbons, 2007; Mellard, Frey, & Woods, 2012; VanDerHeyden, Witt, & Gilbertson, 2007). A more recent longitudinal examination of the effect of RtI on rates of special education determination was conducted by O'Connor, Bocian, Beach, Sanchez, and Flynn (2013). A cohort of students was followed from first through fourth grade and compared to a historical control cohort. By the end of fourth grade, results indicated that 3.4% of students in the RtI

cohort were found eligible as learning disabled in comparison to 5% of the comparison cohort. This difference, however, was not statistically significant. O'Connor et al. also found that those students in the RtI context who ultimately were identified as learning disabled were significantly more impaired in reading outcomes (ESs = 0.64–0.82) than students in the comparison cohort identified as learning disabled. The authors noted that such findings lend support to the notion that RtI helped distinguish between students who were truly learning disabled and those who had difficulties related to instructional factors.

Although findings are encouraging, much of the research to date has not specially targeted the upper elementary grades. Many of the RtI studies that included students across the elementary grades provide only a general description of school-wide implementation and related findings. In essence, little is known about specific instructional elements, including core and supplemental reading instruction, during RtI implementation for students beyond the earliest grades. Hill, King, Lemons, and Partanen (2012) raised this concern with regard to the understanding of Tier 1 reading instruction in general. In a review of 22 intervention studies, they found that most did not provide any direct, quantitative data on the type of reading instruction occurring in the general education classroom. It is important to note that Hill and colleagues' search produced only RtI-related intervention studies in the early grades (kindergarten through Grade 3); we did locate a recent intervention (supplemental reading instruction) study involving fourth-grade students that reported instructional quality for the students' core reading instruction but did not address details on the components of instruction implemented (Ritchey et al., 2012).

Although descriptions of Tier 1 instruction are noticeably absent in recent intervention research, the extant literature is not without observational studies of core reading instruction for students with or at risk for reading difficulties in the upper elementary grades. Studies reporting how teachers spend their instructional time suggest a relatively small percentage of time in direct reading instruction and often significant amounts of time in nonreading activities, such as classroom and task management (Allington & McGill-Franzen, 1989; Gelzheiser & Myers, 1991; Haynes & Jenkins, 1986; Thurlow, Ysseldyke, Graden, & Algozzine, 1983). Gelzheiser and Myers (1991) reported that in the general education classroom, 16% of time in fourth- and fifth-grade classrooms was devoted to oral reading/decoding, 14% to indirect reading activities, and 13% to comprehension. Taylor, Pearson, Peterson, and Rodriguez (2003) found that fourth-grade teachers allocated 27% of instruction to comprehension skills or strategies, 15% to vocabulary instruction, and 13% to phonics activities. A relatively consistent finding across the above-mentioned studies was that teachers spent equal or lesser amounts of instructional time in whole-group instruction versus small-group and individual instruction. Few studies have investigated the relationship between reading instruction and student outcomes, with only Haynes and Jenkins (1986) reporting data disaggregated for students with reading difficulty; the amount of time spent in direct or indirect reading activities did not predict end-of-year performance above and beyond initial status. It is noteworthy that all of these studies were conducted prior to RtI policy implementations (2004).

Although informative, there are several limitations to the extant literature. The relationship between how teachers allocate their instructional time during core reading instruction in the upper elementary grades and outcomes for students with reading difficulties has largely not been explicitly addressed. Perhaps more important, we were unable to locate any studies of core reading instruction involving students with reading difficulties in the upper elementary grades that have been conducted since 2004, which is problematic for several reasons. Although it has been posited that approximately 70% to 80% of students should be able to exhibit adequate reading achievement with Tier 1, differentiated instruction only (e.g., Vaughn, Wanzek, Woodruff, et al., 2007), studies of school-based implementation of RtI reveal that this is often not the case (e.g., Burns et al., 2005). Thus, understanding specific components of Tier 1 instruction that may lead to improved outcomes has the potential to improve instruction and reduce the number of students requiring additional supports. Furthermore, to date no studies with upper elementary students have examined the influence of both core and supplemental reading instructional variables simultaneously. This may provide a better understanding of

combinations of instructional factors that may improve reading outcomes for students with reading difficulties.

Thus, there were two primary aims in the present study. The first aim was to provide descriptive, observational data on both general classroom reading instruction and supplemental reading intervention for students with reading difficulty in fourth grade. The second specific aim was to determine the extent to which these instructional practices influence end-of-the-year student reading outcomes.

## Methods

### Participants

This study's sample was drawn from a cohort of students participating in a larger randomized controlled trial (Wanzek et al., in press) investigating the efficacy of a reading intervention for fourth-grade struggling readers, defined as those performing at or below the 30th percentile on the Reading Comprehension subtest of the Gates-MacGinitie Reading Tests (GMRT; MacGinitie, MacGinitie, Maria, Dreyer, & Hughes, 2006). Because we were interested in describing typical (i.e., school-provided) instruction and intervention, only the 110 students with reading difficulties who were assigned to the comparison condition in the larger project were included in the present sample. Female students made up 52% of the sample. With regard to ethnicity, 36% of the students were identified as Hispanic, and the racial composition of the sample was 43% African American, 32% Caucasian, 17% American Indian, 3% Asian, and 4% multiracial. Nearly three quarters (71.8%) of the students participated in the free or reduced lunch program; 14% were identified by the district as English language learners or limited English proficient; and 16% were identified as having a disability, with specific learning disability and speech/language impaired most prevalent. A total of 10 students (9% of the sample) withdrew from their respective schools during the school year, and thus 100 students were available for the posttest assessment. There were no significant differences in pretest performance on any of the reading variables between students who withdrew and those students who remained in their school for the entire year.

A total of 22 reading classrooms, 10 schools, and four districts in Florida (FL) and Texas (TX) were represented in the sample. The school district in TX was located in a large, urban metropolitan area. By contrast, two of the three districts in FL were situated in more rural areas and the third within a mid-size city. All but one school utilized the same core reading program at fourth grade. Both reading programs utilized across the schools would be considered comprehensive in nature, addressing essential components of reading, including advanced word analysis strategies, fluency, vocabulary/word knowledge, and comprehension strategies. These reading programs expect students at the fourth-grade level to engage in literary analysis and response through the close reading of engaging texts.

### Measures of reading skills

As part of the larger intervention study, participating students were administered a battery of reading and related measures. In the present study, we were interested in the impact of reading instruction on student reading outcomes in multiple critical domains encompassing lower and higher level skills. Thus, we chose to utilize multiple measures of word reading, reading fluency, and comprehension in order to create latent variables of student reading ability.

#### Word reading

Measures of word recognition and decoding on the Woodcock–Johnson Psycho-Educational Test Battery–III (WJ–III; Woodcock, McGrew, & Mather, 2001) were utilized as indicators of students' word reading ability. The Letter-Word Identification subtest includes 76 items that increase in difficulty, and students are required to name individual letters as well as decode and/or identify real

words presented. The Word Attack subtest, which measures decoding skill utilizing pseudowords, has items that proceed from the identification of a few single letter sounds to the decoding of complex letter combinations. For these subtests, test–retest reliability is .81–.85 for fourth grade, whereas mean split-half reliability is .87–.94.

### Fluency

To measure students' ability to read connected text with speed and accuracy, we administered the Oral Reading Fluency (ORF) measure from the Dynamic Indicators of Basic Early Literacy Skills–Sixth Edition (Good & Kaminski, 2002). The median number of correct words read per minute (CWPM) across three passages was considered the ORF rate. Test–retest reliabilities for ORF with elementary-age students range from .92 to .97; alternate-forms reliability across passages from the same level was reported as .89–.94.

### Reading comprehension

The GMRT Comprehension subtest (MacGinitie et al., 2006) is a group-administered, norm-referenced test for individuals in kindergarten through adulthood. The Comprehension subtest presents students with multiple paragraph-length narrative and expository reading passages and related multiple-choice questions. Questions address facts, inferencing, and drawing conclusions, and students have 35 min to complete the 48 items. Test–retest reliabilities are greater than .85; alternate-forms reliability is .86 for the fourth-grade level. Students were also administered the Passage Comprehension subtest from the WJ–III (Woodcock et al., 2001). This subtest is administered individually and represents a cloze measure wherein students are presented with several sentences that include a missing word(s). Students read the sentences silently and are asked to supply the missing word. Test–retest reliability for Passage Comprehension is .86 for fourth grade, and median concurrent validity correlations were reported as .62 and .79 with other norm-referenced measures.

## Instructional variables

An adapted version of the Instructional Content Emphasis Instrument–Revised (ICE–R; Edmonds & Briggs, 2003) was utilized to code reading instruction and supplemental intervention received by students. The ICE–R allowed for coding across two instructional dimensions—content and grouping—as well as ratings for student engagement and instructional quality. Specific instructional activities were coded if they lasted for at least 1 min. Categories of instruction included phonological awareness (e.g., segmenting, blending, and/or manipulating spoken language, including phonemes), phonics/word recognition (e.g., letter-sound correspondence, sight words), fluency (e.g., letter/sound naming fluency, word fluency, repeated reading of text), vocabulary/oral language development (e.g., direct teaching of word meanings, categorizing words, use of context within text to gain word meaning), comprehension (e.g., any instruction focused on understanding the meaning of written/oral text), spelling (e.g., learning and/or reproducing conventional spelling), text reading (e.g., students engaged in reading with no other category of instruction occurring), and nonliteracy activities (e.g., other academic instruction, noninstructional time). Raters also coded when multiple instructional activities occurred simultaneously for different students or groups of students, including instances of differentiated instruction. Instructional groupings were coded as either whole class, small group, pairs, independent activity/assignment, or individualized instruction.

Student engagement was coded using a 3-point rubric (3 = *high engagement,* 1 = *low engagement*). Observers rated engagement as high when almost all students in the classroom were actively engaged in the learning activity via reading, writing, listening, and/or discussing a relevant topic. Meanwhile, instances in which more than half of the students in the classroom were engaged in behaviors such as off-topic conversations, inappropriate moving about the classroom, not visually attending to the learning activity, and so on, during instruction were coded as low engagement. Finally, a global

quality of instruction rating was assigned on a 4-point Likert scale (1 = weak, 2 = low average, 3 = high average, 4 = excellent). This instructional quality variable took into account a teacher's use of direct and explicit language, modeling, provision of sufficient opportunities for practice, feedback, constant monitoring and encouragement of engagement, scaffolding of tasks, and pacing (see Table 1).

## Procedures

Pre- and postassessments of reading skills were conducted in the fall and spring. Assessments were counterbalanced by measure and were administered by trained research assistants (RAs); staff were required to demonstrate 100% accuracy in the administration and scoring of each measure prior to being assigned to pre- and posttesting of students in the school setting. In addition, random observations of RAs during test administration in the field were conducted to ensure adherence to protocol. All measures were double scored by a second RA.

To document reading instruction, trained research staff observed each student's general education reading class twice during the school year and coded it using the ICE–R. One observation occurred in the fall (November–December), whereas the second observation was completed in the spring (March–April). All observations were scheduled with the respective teacher in advance and took place during the regularly scheduled reading instructional block. A multiple-step training process was utilized to establish interrater reliability for observations. First, each observer was instructed on the meaning of each code for instruction, grouping, engagement, and quality and provided with specific examples (see above). Second, the coding process was modeled by the principal investigator of the project using a

**Table 1.** Rubric for ratings of instructional quality.

| 4 | 3 | 2 | 1 |
|---|---|---|---|
| Excellent | High average | Low average | Weak |
| Teacher uses language that is direct and explicit | Teacher inconsistently uses language that is direct and explicit | | Teacher uses language that is indirect and implicit |
| Teacher models many examples | Teacher provides some examples | | Teacher provides no models or demonstrations |
| Teacher provides sufficient and varied opportunities for practice | Teacher provides many opportunities for practice with little variation; practice opportunities do not seem to be based on student need | | Teacher provides insufficient opportunities for practice with no variation |
| Teacher provides immediate and corrective and descriptive feedback | Teacher provides inconsistent feedback | | Teacher provides little feedback that is nonspecific or no feedback |
| Teacher adjusts time to meet student needs | Teacher uses time appropriately, but use does not seem based on student need yet still seems adequate for a given activity | | Teacher demonstrates poor use of time that is not differentiated and unrelated to student need or task difficulty |
| Teacher constantly monitors student performance | Teacher monitors some students or monitors all students for some activities | | Teacher demonstrates lack of monitoring or monitors very few students |
| Teacher encourages high student engagement and time on task | Encouragement of student engagement and time on task varies | | Teacher does not encourage student engagement and time on task |
| Teacher scaffolds tasks and materials to meet student needs | Teacher uses scaffolding inconsistently and does not always tailor it to student needs | | Teacher scaffolds inappropriately or insufficiently |
| Teacher uses appropriate pacing, including wait time | Teacher uses inconsistent pacing that varies between appropriate at times, too fast, or too slow and provides insufficient wait time | | Teacher demonstrates poor pacing, either too slow or too fast with no wait time provided |

*Note.* Teachers had to meet most of the observable indicators to be coded in a particular category. High average = some indicators under excellent are present, but the majority fall under average; low average = some indicators under weak are present, but the majority fall under average.

short video segment of reading instruction from another project. Third, each observer practiced coding using several novel video segments that were subsequently discussed with the principal investigator. Finally, each observer established 90% or higher coding accuracy with the principal investigator (i.e., gold-standard approach) on a separate video segment of reading instruction. Observers reestablished reliability prior to spring observations with new video segments. Reliability across coders was 96.4% in both the fall and spring. In addition, audio recording of school-provided supplemental reading instruction occurred in fall, winter, and spring for any student receiving reading intervention during the school day. By and large, these interventions were considered Tier 2 support by the respective schools. Each supplemental reading session recording was coded by the first author or trained RAs. Reliability was established using the process outlined previously for Tier 1 observations. A random selection of 25% of all recordings were double coded; interrater agreement was 95.2%.

### Data analysis methods

To provide observational data on reading instruction and intervention, we computed descriptive statistics for instructional variables observed and coded during Tier 1 reading instruction and supplemental intervention. For Tier 1 instruction, comparisons across the FL and TX sites were also conducted to determine any site differences; the Benjamini–Hochberg correction procedure (Benjamini & Hochberg, 1995) was utilized to control for Type I error. To determine the extent to which instructional practices influenced achievement, we conducted a series of multilevel analyses (students nested in teachers) predicting spring reading outcomes from Tier 1 instructional variables. We used latent variables for the student reading outcomes to account for the influence of measurement error that is present when a single observed indicator is used. Outcomes included word study/decoding, reading fluency, and comprehension. Confirmatory factor analysis was utilized to assess the adequacy of the proposed latent factors. Because of the potentially large number of Tier 1 instructional variables examined as predictors of achievement, we reduced the data by combining variables into a composite variable of instructional time allocated to phonics, word recognition, and spelling (word study); a composite variable of time allocated to fluency instruction and text reading (reading fluency/text reading); and a composite variable of time allocated to vocabulary/oral language and reading comprehension instruction (vocabulary/comprehension). In addition, time allocated for multiple instructional activities (ideally indicative of differentiated instruction) and the global instructional quality variable were also included. Fall reading achievement (latent variables) was included as a covariate. The covariate and all predictors were grand mean centered in the analyses. The reduced-form two-level model was as follows:

$$\begin{aligned}\text{Outcome}_{ij} = {} & \gamma_{00} + \gamma_{10}{*}\text{Covariate}_{ij} + \gamma_{01}{*}\text{T1WordStudy}_{j} \\ & + \gamma_{02}{*}\text{T1Fluency\_TextRead}_{j} + \gamma_{03}{*}\text{T1Vocab\_Comp}_{j} . \\ & + \gamma_{04}{*}\text{T1Multiple}_{j} + \gamma_{05}{*}\text{T1Quality}_{j} + r_{ij} + U_{0j}\end{aligned}$$

We also conducted secondary analyses to determine the effect of receiving supplemental reading instruction by assigning a dummy-coded intervention variable (Level 1) to each student. The resulting regression coefficient represented the difference in the respective spring outcome between students who received supplemental instruction and those who received Tier 1 reading instruction only after we controlled for initial status and Tier 1 instruction. For parsimony, nonsignificant Tier 1 predictors in the initial multilevel model (above) were removed from this second model. The reduced-form two-level model for this model was as follows:

$$\begin{aligned}\text{Outcome}_{ij} = {} & \gamma_{00} + \gamma_{10}{*}\text{Covariate}_{ij} + \gamma_{20}{*}\text{Intervention}_{ij} \\ & + \gamma_{01}{*}\text{T1WordStudy}_{j} + \gamma_{02}{*}\text{T1Fluency\_TextRead}_{j} \\ & + \gamma_{03}{*}\text{T1Vocab\_Comp}_{j} + \gamma_{04}{*}\text{T1Multiple}_{j} \\ & + \gamma_{05}{*}\text{T1Quality}_{j} + r_{ij} + U_{0j}\end{aligned} .$$

## Results

### Descriptive statistics

With the exception of word-level skills, students in the sample demonstrated below-average ORF and comprehension skills. The mean scaled score on the GMRT Comprehension measure equated to approximately the 15th percentile in the fall ($M = 441.16$, $SD = 17.79$), with an improved (on average) level of performance to the 19th percentile for the sample of students in the spring ($M = 455.31$, $SD = 23.30$). On WJ–III Passage Comprehension, mean standard scores were stable yet below average across fall ($M = 88.10$, $SD = 10.58$) and spring ($M = 88.97$, $SD = 7.57$). In the fall, the sample mean for ORF was 84.87 ($SD = 27.38$) CWPM, which was below the established benchmark of 93 CWPM. An improvement of about 16 CWPM was noted from fall to spring ($M = 100.42$, $SD = 23.81$); given the spring benchmark of 118 CWPM, the sample mean remained below average. Across both fall and spring, students exhibited generally average achievement on measures of decoding (fall, $M = 97.07$, $SD = 10.65$; spring, $M = 95.86$, $SD = 8.83$) and word recognition (fall, $M = 96.60$, $SD = 10.27$; spring, $M = 95.15$, $SD = 9.79$). Correlations between measures were generally moderate to strong in magnitude both within and across time periods ($rs = .22–.93$).

### Observations of reading instruction

#### Tier 1 instruction

Observations of core reading instruction were conducted for all but one teacher, who was not observed because of school policy; thus, the present descriptive data include 21 teachers in nine schools (see Table 2). The mean length of the Tier 1 instructional block was 74.73 min ($SD = 28.70$), with significant variation in time allocation, ranging from under 0.5 hr (27 min) to a maximum of just over 2 hr (123 min). Instruction focused on comprehension of written or oral text was most prevalent, occurring an average of approximately 30 min, or 40%, of observation periods. Vocabulary instruction was provided nearly 10 min per day, accounting for 13% of Tier 1 instruction. Meanwhile, teachers spent limited time instructing in other reading components. They allocated just over 3 min (4%) to the reading of connected text absent of comprehension instruction and just over 2 min to ORF (3%) during core reading instruction. Furthermore, instruction devoted to spelling or phonics skill occurred on average less than 30 s during classroom observations (<1% each); formal phonics instruction occurred during only one of the 41 Tier 1 observations. No instruction in phonological awareness was observed. Simultaneous instruction in multiple skills across different individuals or groups of students was evident for nearly 15 min (20%) of observational time. Note that approximately 14 min (18%) of allocated time in Tier 1 was spent in nonreading instruction, and thus actual instructional time focused on reading skills averaged about 1 hr.

**Table 2.** Components of Tier 1 instruction across and between sites.

| | Overall | | Florida | | Texas | | |
|---|---|---|---|---|---|---|---|
| Instructional activity | *M* (*SD*) | Range | *M* (*SD*) | Range | *M* (*SD*) | Range | *p* |
| Tier 1 minutes | 74.73 (28.70) | 27–123 | 91.81 (20.72) | 27–123 | 45.13 (10.29) | 27–59 | <.001* |
| Total reading instruction | 60.95 (22.91) | 20–114 | 72.46 (20.11) | 20–114 | 41.00 (10.21) | 27–56 | <.001* |
| Multiple instructional activities | 14.66 (20.93) | 0–78 | 23.12 (22.31) | 0–78 | 0 | | |
| Phonemic awareness | 0 | | 0 | | 0 | | |
| Phonics | 0.07 (0.47) | 0–3 | 0.12 (0.59) | 0–3 | 0 | | |
| Spelling | 0.49 (1.98) | 0–11 | 0.77 (2.46) | 0–11 | 0 | | |
| Fluency | 2.32 (8.03) | 0–47 | 2.58 (9.44) | 0–47 | 1.87 (4.94) | 0–15 | .744 |
| Text reading | 3.29 (5.40) | 0–19 | 1.88 (4.74) | 0–19 | 5.73 (5.75) | 0–15 | .049* |
| Vocabulary | 9.76 (11.15) | 0–40 | 10.04 (9.66) | 0–36 | 9.27 (13.72) | 0–40 | .069 |
| Comprehension | 30.37 (16.21) | 0–69 | 33.96 (16.83) | 2–69 | 24.13 (13.40) | 0–46 | .841 |
| Other academic instruction | 7.22 (12.58) | 0–38 | 10.27 (14.33) | 0–38 | 1.93 (6.19) | 0–24 | .046* |
| Noninstructional time | 6.56 (6.83) | 0–26 | 9.08 (7.28) | 0–26 | 2.20 (2.54) | 0–8 | .002* |

*Significant after adjustment for multiple comparisons.

There were a few significant differences in Tier 1 instruction across the FL and TX sites (see Table 2). After we accounted for multiple comparisons, the mean length of Tier 1 was significantly longer in the FL sites ($M = 91.81$ min) than in the TX sites ($M = 45.13$). Similarly, the total amount of reading-specific instructional time was significantly higher in the FL sites ($M = 72.46$) in comparison to the TX sites ($M = 41.00$). Note that the amount of noninstructional time ($M = 9.08$) and time spent in other academic instruction ($M = 10.27$) in the FL sites was significantly greater than in the TX sites ($M = 2.20$ for noninstruction, $M = 1.93$ for other academics). The only significant difference in time allocated to instruction in a specific reading skill between sites was in reading of connected text; on average, nearly 6 min was spent in the TX sites in comparison to just under 2 min in the FL sites.

Observational data related to grouping structures, as well as instructional quality and student engagement during Tier 1, are provided in Table 3. In general, whole-class reading instruction was predominant, averaging just over 42 min, or 56%, of instructional time. Independent instruction, whereby students worked individually on the same or a similar activity, was evident for nearly 10 min (13%) during observations. Reading instruction involving pairs/partners averaged just over 6 min (8%), whereas small-group instruction accounted for 2 min, or 3%, of instructional time during Tier 1. As noted previously, nearly 15 min (20%) of the time teachers engaged in instruction involving multiple grouping formats simultaneously. Further analyses of potential site differences indicated that only the amount of time spent in whole-group reading instruction was significantly different between sites; on average, nearly 49 min of whole group was evident in the FL sites in comparison to just 30 min in the TX sites. Across observations, ratings of instructional quality ranged from 2 to 4, with a mean of 3.27 ($SD = 0.59$), suggesting high average Tier 1 instruction. Student engagement ratings were also high, with a mean of 2.85 ($SD = 0.36$). There were no significant differences across sites with regard to instructional quality or student engagement.

### *Supplemental reading instruction*

Less than a third of the sample ($n = 35$) received direct supplemental reading instruction from a teacher during the school day. All students were identified for this support by their respective schools and independent of the research. Of these students, 25 received additional reading instruction from their classroom teacher during a designated intervention time, whereas nine students received pull-out instruction from other teachers such as a reading specialist or special education teacher; one student received instruction from a paraprofessional. All but three students received supplemental instructional daily, with the others receiving instruction 3–4 days per week. The majority (83%) were instructed in groups of eight or more students, 11% in groups of four to five, and the remaining in groups of two to three or individually. On average, additional reading instruction received by students in the sample was approximately 25 min ($M = 25.15$, $SD = 11.13$) per day, with a range from 10 to 55.50 min. During the additional reading instruction, students most often received instruction related to comprehension of text ($M = 9.14$, $SD = 3.48$) and vocabulary and oral language development ($M = 5.90$ min, $SD = 7.16$). Students engaged in text reading for approximately 4.5 min during their additional instruction ($M = 4.46$, $SD$, 3.14), whereas on average students received phonics/decoding instruction for just over 1 min ($M = 1.37$, $SD = 4.94$) and ORF practice for just under 1 min ($M = 0.97$,

**Table 3.** Instructional grouping, quality, and engagement during Tier 1 across and between sites.

| | Overall | | Florida | | Texas | | |
|---|---|---|---|---|---|---|---|
| Variable | *M* (*SD*) | Range | *M* (*SD*) | Range | *M* (*SD*) | Range | *p* |
| Instructional grouping | | | | | | | |
| Whole group | 42.05 (18.52) | 10–88 | 48.96 (17.72) | 22–88 | 30.07 (13.30) | 10–56 | .002* |
| Small group | 2.37 (5.53) | 0–27 | 2.54 (6.45) | 0–27 | 2.07 (3.58) | 0–12 | .746 |
| Pairs | 6.12 (9.14) | 0–32 | 7.62 (9.99) | 0–32 | 3.53 (7.00) | 0–18 | .215 |
| Independent | 9.04 (11.20) | 0–38 | 9.58 (12.08) | 0–38 | 9.47 (9.90) | 0–24 | .976 |
| Instructional quality | 3.27 (0.59) | 2–4 | 3.31 (0.55) | 2–4 | 3.20 (0.68) | 2–4 | |
| Student engagement | 2.85 (0.36) | 2–3 | 2.77 (0.43) | 2–3 | 3.00 (0) | | |

*Significant after adjustment for multiple comparisons.

$SD = 2.91$). Minimal instruction was received in spelling ($M = 0.22$, $SD = 1.28$) and phonological awareness ($M = 0.08$, $SD = 0.46$). During additional reading instruction, 3.5 min were spent in other academic instruction and/or noninstruction ($M = 2.95$, $SD = 3.88$, for other academic instruction; $M = 0.50$, $SD = 1.19$, for noninstruction). In summary, word study skills were addressed for less than 2 min per day ($M = 1.68$, $SD = 6.61$). On average, students read text or practiced ORF approximately 5 min ($M = 5.43$, $SD = 5.05$) and received vocabulary or reading comprehension instruction for 15 min per day ($M = 15.04$, $SD = 8.48$). When students received additional reading instruction, they were most frequently instructed in small groups ($M = 22.93$, $SD = 8.70$); this accounted for 91% of instructional time. Independent instruction averaged just over 1 min ($M = 1.44$, $SD = 2.83$), whereas instruction in pairs of students occurred for less than 1 min ($M = 0.78$, $SD = 1.95$). The mean quality of additional reading instruction was 3.24 ($SD = 0.34$), indicating high average overall instruction.

## The impact of instruction on student outcomes

### Confirmatory factor analysis

To examine the adequacy of the proposed latent factors, we conducted confirmatory factor analysis for the fall and spring time periods, respectively. Evaluation of the fit indices for the fall assessment indicated excellent model fit: $\chi^2(11, N = 110) = 19.65$, $p = .05$, comparative fit index = .988, Tucker–Lewis index = .977, root mean square error of approximation = .085 (confidence interval [.000, .144]), standardized root-mean-square residual = .029. Similarly, the model fit in the spring was excellent: $\chi^2(11, N = 101) = 14.62$, $p = .20$, comparative fit index = .994, Tucker–Lewis index = .989, root mean square error of approximation = .057 (confidence interval [.000, .126]), standardized root-mean-square residual = .047. Once the adequacy of the proposed latent factors was confirmed, estimated latent factor scores were derived; these factor scores in fall and spring were utilized as the covariate and the outcome variable. Correlations between the latent factors were all significant at the .01 level and were moderate to large, ranging from .54 to .88. Within-factor correlations between fall and spring were large: .88, .96, and .99 for reading comprehension, word reading/decoding, and ORF, respectively.

### Multilevel analyses

Given the large number of instructional variables, composite variables for Tier 1 were utilized as predictors. In terms of Tier 1, instructional time allocated to word study skills (i.e., phonological awareness, phonics, spelling) was less than 1 min per day ($M = 0.55$, $SD = 1.37$). Instruction focused on text reading and ORF development averaged nearly 6 min ($M = 5.79$, $SD = 6.38$), whereas vocabulary and reading comprehension instruction was most prevalent, occurring for 40 min per day ($M = 40.07$, $SD = 10.07$). Time spent in multiple simultaneous instructional activities and the global quality rating for Tier 1 were also included as independent variables. Correlations between the Tier 1 variables and student outcomes are provided in Table 4.

*Word reading/decoding.* The baseline model revealed that approximately 6% (5.8%) of the variance in students' growth (i.e., above and beyond initial status) in word reading and decoding skill was

**Table 4.** Correlations between Tier 1 predictors and student outcomes in spring.

| Variable | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1. Differentiated instruction | — | | | | | | | |
| 2. Minutes of word study | .35 | — | | | | | | |
| 3. Minutes of text reading/fluency | −.04 | −.31 | — | | | | | |
| 4. Minutes of vocabulary/comprehension | −.01 | .33 | −.35 | — | | | | |
| 5. Global Tier 1 quality | .51* | .00 | −.21 | −.12 | — | | | |
| 6. Spring word reading | .15 | −.22 | .14 | .06 | .03 | — | | |
| 7. Spring oral reading fluency | .14 | −.06 | .21 | .18 | .19 | .75* | — | |
| 8. Spring reading comprehension | .28 | −.33 | .02 | −.09 | .12 | .70* | .58* | — |

*Significant at the .05 level.

across teachers. The teacher-level Tier 1 instructional predictors were then added to the model at Level 2. Given this model, only the rating of Tier 1 instructional quality significantly predicted growth in students' word reading and decoding after accounting for initial status, although the observed relationship was negative ($\gamma_{05} = -4.65$, $p = .01$). Results suggested that for students at the sample mean of word reading/decoding performance in the fall and receiving the average amount of instructional time across dimensions, every 1-point increase in the rating of Tier 1 instructional quality would result in an estimated decrease of .28 *SD* units in their spring word reading/decoding latent factor score. In comparison to the baseline model, the inclusion of these Tier 1 predictors accounted for 98% of the variance across teachers and less than 1% of the student-level variance in the outcome. As none of the time allocation variables had a significant effect on the spring outcome, they were removed from further models for parsimony. Next we analyzed the influence of receiving supplemental reading instruction by adding a dummy-coded intervention variable to the trimmed Tier 1 model (i.e., Tier 1 quality only). The estimated effect of receiving supplemental reading instruction was not significant ($p = .86$). Furthermore, after we accounted for supplemental instruction, Tier 1 instructional quality was no longer significant ($p = .08$). In summary, only initial status in word reading and decoding was significantly related to spring performance across both models ($p < .001$).

***ORF outcome.*** The specified baseline model indicated that 3% of the variance was at the teacher level. Next we ran the model including Tier 1 instructional variables as predictors, accounting for initial status. None of the Tier 1 variables uniquely predicted student outcomes when we accounted for the other variables. Predictors were also entered individually; however, none reached significance ($p$s = .23–.99). Note that the addition of these instructional predictors to the model resulted in increased variance between teachers in comparison to the baseline model; there was a minimal decrease (1.5%) in student-level variance. As no Tier 1 predictors were significant, they were deleted from the subsequent model for parsimony. Results of the model investigating the impact of supplemental instruction indicated that the effect of intervention was significant ($\gamma_{20} = 2.20$, $p = .04$). Among students at the sample mean in the fall, those who received this additional supplemental reading instruction scored on average .07 *SD* higher on the spring ORF latent variable than those students who did not receive additional instruction. This model explained 3.2% of the student-level variation in the ORF outcome.

***Reading comprehension outcome.*** According to the baseline model, just over 3% (3.3%) of the variance in the outcomes was attributed to between-teacher differences. Next Tier 1 instructional predictors were added to the baseline model. After we accounted for fall reading comprehension, both the amount of instructional time spent in text reading and/or ORF practice ($\gamma_{03} = -0.13$, $p = .05$) and the quality of Tier 1 reading instruction ($\gamma_{05} = -3.55$, $p = .01$) were uniquely but negatively related to students' spring reading comprehension. All other instructional predictors were nonsignificant while initial reading comprehension status was significant ($p < .001$). The findings suggested that for every additional minute of instruction in text reading or ORF above 5.79 min (the sample mean) during Tier 1, a student's spring reading comprehension factor score would be expected to decrease by .02 *SD*. Also, for every 1-point increase in the Tier 1 instructional quality rating above the sample mean ($M = 3.26$), students' spring reading comprehension performance decreased .43 *SD*. This model accounted for 97% of the teacher-level variance in student outcome and less than 1% of between-student variation. The subsequent model examined the impact of supplemental instruction while retaining minutes of text reading/ORF instruction and ratings of the quality of Tier 1. Results indicated that the effect of supplemental reading instruction was not significant ($\gamma_{20} = -0.211$, $p = .763$). In this model, neither the number of instructional minutes allocated to text reading and ORF development during core instruction ($\gamma_{02} = -0.12$, $p = .08$) nor the rating of instructional quality ($\gamma_{03} = -1.93$, $p = .08$) remained significant. Students' fall reading comprehension performance was a significant predictor of spring reading comprehension ($p < .001$) across models. The final model explained

62% of the between-teacher variance in spring reading comprehension scores and less than 1% of the student-level variation.

## Discussion

Students who enter the upper elementary grades with exhibited difficulties in reading-related skills are at increased risk for continued reading difficulties as well as for academic failure and school dropout (Francis et al., 1996; U.S. Department of Education, 2006). With this in mind, the objective of this study was to examine current instructional practices during Tier 1 (core) and supplemental reading instruction in fourth grade and their impact on reading outcomes for struggling readers. Our initial findings revealed significant variability in the number of minutes allocated to Tier 1 instruction, with some teachers averaging only 0.5 hr and others close to 2 hr. This disparate amount of instructional time available is similar to previous observational studies of reading instruction for students with reading difficulties and disabilities in the upper elementary grades (e.g., Allington & McGill-Franzen, 1989; Haynes & Jenkins, 1986; Thurlow et al., 1983). On closer observation, we found it surprising that teachers in the TX sites averaged only half the amount of time in Tier 1 as teachers in the FL sites despite the fact that the core reading programs were identical across all but one school and that both states had implemented reading initiatives requiring 90 min of core reading instruction (FL Admin. Code, 2012; Texas Education Agency, 2012). On average, Tier 1 was approximately 45 min longer in duration in the FL sites; when extrapolated, this could mean up to 135 hr of additional reading instruction for these students than for those students with reading difficulties in the TX sites.

However, our results suggest that the number of minutes of Tier 1 alone does not necessarily equate to the amount of actual reading instruction provided to students. On average, just over 18% of the minutes allotted were spent in activities other than reading instruction (e.g., other academic instruction, behavior management). Thus, although the daily Tier 1 instructional block averaged just over 74 min in these classrooms, teachers utilized 1 hr of this time for actual reading-specific instruction. In general, this finding mirrors previous observational studies at both the upper elementary (e.g., Gelzheiser & Myers, 1991; Haynes & Jenkins, 1986) and younger (e.g., Kent, Wanzek, & Al Otaiba, 2012) grade levels that observed discrepancies between the time allotted and actually implemented for core reading instruction. Further examination showed that in the FL sites, 79% of Tier 1 was spent on reading instruction, whereas the figure was 91% in the TX sites.

Although the teachers in the FL sites spent more time in nonreading activities, students in FL received comparatively more reading instruction (72 min) than their peers in the TX sites (41 min). By and large, the additional time in the FL sites was coded as instruction involving multiple simultaneous reading activities; teachers in FL averaged nearly 23 min while this type of instruction was not evident in the TX sites. As previously noted, this code was utilized for any instance of teacher instruction in two or more simultaneous activities within the classroom including differentiated instruction. Differentiated reading instruction has the potential to increase student achievement through the provision of more explicit, direct instruction in targeted skill areas (e.g., Castle, Deniz, & Tortora, 2005). However, multiple simultaneous instructional activities does not necessarily represent the actual degree to which instruction was specifically targeted (i.e., differentiated) to an individual or group of students. In fact, anecdotal observational records indicated that this code was frequently used during instructional centers most often characterized by a set of instructional activities that small groups of students would rotate through during the course of the instructional period. The seeming absence of truly differentiated reading instruction may not be surprising given previous research demonstrating teachers' infrequent utilization of skills-based targeted instruction and general preference for whole-class activities in the general education classroom prior to the implementation of RtI (e.g., Schumm, Moody, & Vaughn, 2000). Finally, the absence of multiple instructional activities, including differentiated instruction, in the TX sites could be attributed to the limited amount of time actually available to teachers.

Competing demands from managing multiple instructional activities and/or groups between such activities could potentially minimize the direct instruction from the teacher during an already limited timeframe in Tier 1 (Hong & Hong, 2009).

Results also demonstrated that reading instruction in these fourth-grade classrooms was predominantly focused on comprehension and vocabulary instruction, accounting for nearly two thirds (~40 min) of the actual minutes spent in reading instruction. In comparison to previous research, this represents an increase in core instructional time specifically dedicated to these components of reading (Gelzheiser & Myers, 1991; Taylor et al., 2003). This instructional focus not only represents the fundamental shift in reading at the upper elementary grades but also may serve to meet increasing state and national standards for comprehending a variety of text genres and help develop a greater depth and flexibility in the use of strategies required for proficient reading at this level (Duke & Pearson, 2002; Perfetti, Landi, & Oakhill, 2005). Perhaps one of the most surprising findings was the absence of instruction in phonics and structural analysis during Tier 1; across 41 observations, only a single instance of such instruction was coded. This is also noteworthy given that students were selected because their comprehension scores were at or below the 30th percentile and they may have benefited from such instruction, or from opportunities to enhance their ORF, in order to increase comprehension of connected text. By comparison, Taylor et al. (2003) reported nearly 10% of core reading instruction allocated to these foundational skills. The present observational results are concerning given that difficulties in word analysis skills and efficient decoding of multisyllabic words are common in students who struggle with reading in the upper grades (Leach et al., 2003). In fact, nearly half of the students in our study exhibited word reading and/or decoding skills below the 40th percentile. Furthermore, to assist with continued reading development beyond the primary grades, explicit instruction in advanced word study along with vocabulary and comprehension has been recommended for *all* students (Kamil et al., 2008).

In regard to the finding of limited basic skill instruction during Tier 1, one might argue that for struggling readers, such skills could/should be addressed during supplemental intervention. Of the 110 students in this study, however, less than a third actually received direct supplemental reading instruction during the school day. This may be partially due to the fact that the students in the sample were identified as struggling readers through the larger research project and not necessarily by their respective teachers or schools. Further investigation revealed that the 35 students who received supplemental reading instruction demonstrated difficulties across multiple reading dimensions, including basic reading skills; thus, another explanation may be that limited school resources may only allow the most at-risk students to receive reading intervention. However, findings demonstrated that the word-level skills of these students were minimally addressed (<2 min) during the reading intervention and that intervention sessions were predominantly focused on vocabulary and comprehension, similar to Tier 1.

When we examined the impact of core and supplemental instruction on student outcomes, our results demonstrated only minimal effects. An unexpected finding was the negative relationship between Tier 1 quality and both word reading and reading comprehension achievement after we accounted for minutes of instruction. Given that this relationship was no longer significant in subsequent analyses that accounted for students receiving Tier 2, we conducted further investigation. This revealed a significant difference ($p = .026$) in mean ratings of instructional quality for teachers of students who received Tier 2 in comparison to those who only received Tier 1. In essence, the highest rated teachers had the lowest performing students, and thus the result appears to be an artifact of the students in the class and the fact that there was no effect of supplemental instruction on student achievement in word reading and comprehension. In sum, the lowest students (based on word reading and comprehension, respectively) in fall remained the lowest students in spring. Our results also demonstrated that increased minutes of Tier 1 spent in text reading (absent other instruction) and/or ORF practice was negatively related to comprehension outcomes. Practically speaking, this translated to an effect of .13 *SD* in comprehension outcome for every 6 min (1 *SD*) of such instruction above/below the sample mean. It may be that as teachers make decisions to increase instruction in

one area, such as text reading or fluency practice, less time is available for other instruction—in this case, reading comprehension—resulting in the diminished outcomes. In this study, time spent in text reading and fluency practice was negatively correlated ($r = -.32$) with time spent in comprehension and language/vocabulary instruction, suggesting that teachers who spent more time in fluency practice allocated less time for comprehension and oral language instruction.

The last finding from the analyses was the small effect of supplemental instruction on reading fluency outcomes only; the effect size was 0.07 in favor of students receiving reading intervention. This is encouraging given that on average 5 min of supplemental instruction was allocated to text reading and fluency practice. Thus, when included as part of a multicomponent intervention, small amounts of engagement with connected text with a focus on efficient, fluent reading have the potential to aid in the development of students' ORF. Conversely, there was no significant effect of supplemental instruction on word reading and comprehension outcomes. The lack of impact on word reading is not surprising, because minimal time was devoted to addressing these skills during the intervention. However, students did receive approximately 15 min of additional instruction in comprehension and vocabulary development. One potential explanation is that given the pervasive nature of these particular students' reading difficulties across multiple areas, this supplemental reading instruction was simply not intensive enough to promote significant gains in one school year. Vaughn et al. (2012) found that among students entering middle school with reading difficulties, multiple years of supplemental instruction were required in order for students to demonstrate improved outcomes relative to peers.

### Limitations and future directions

A primary limitation of the present study is the small sample size of students with reading difficulties. Although this was an artifact of drawing the sample from a larger existing project, it nonetheless limits the power to detect relationships among multiple instructional predictors and student outcomes. Moreover, although this study sought to add to the observational literature on classroom reading instruction and the impact on student outcomes for students with reading difficulties, it is possible that by observing only Tier 1 and supplemental instruction we did not fully capture all of the reading instruction received; that is, students may have received additional reading instruction during core content classes. Future observational research of instruction across the entire school day may allow for a more nuanced understanding of access to reading instruction for struggling readers. Finally, this research only considered Tier 1 and supplemental instruction taking into account students' initial reading status in the fall of fourth grade. There was still unexplained student-level variance that could have been accounted for by examining the effect of other student characteristics that might impact a student's response to instruction. Several student-level variables appear to be related to whether a younger student demonstrates adequate RtI, including memory, rapid naming, vocabulary, IQ, and attention/behavior (e.g., Al Otaiba & Fuchs, 2006; Nelson, Benner, & Gonzalez, 2003). Thus, in order to advance the extant literature on reading instruction, research that examines both instructional and student-level factors in the upper elementary grade students would be warranted.

In conclusion, the present study sheds important light on current pedagogical practices in reading for struggling readers in upper elementary grades. More research is certainly needed to both validate and extend current findings in this era of RtI and ever-increasing standards (e.g., CCSS, 2010). This is particularly important given the absence of similar studies in the past decade. The convergence of evidence from multiple observational studies of reading instruction at this level would assist in the identification of the most efficacious mix of instructional practices, most critically at Tier 1, that lead to enhanced reading outcomes for struggling readers. More specifically, questions such as the optimal time that should be allocated to lower level skills and/or whether such skills are better served by being addressed during intervention remain unanswered. Studies that critically examine the link between existing core reading programs utilized in the classroom and teacher pedagogical practices (as well intervention practices) are likely to provide critical information to schools in their attempts to support students exhibiting continued difficulties in reading.

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