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Child Skills and Teacher Qualifications: Associations with Elementary Classroom Teachers' Reading Instruction for Struggling Readers

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This study explored the extent to which kindergarten and first grade teachers provided individualized reading instruction to struggling readers during a unique one-on-one reading instruction task. Three outcomes of teachers' instructional strategies were captured: code-focused strategies, meaning-focused strategies, and level of challenge. Child skills in decoding and vocabulary/oral language as well as teacher qualifications of education, experience, and knowledge of reading were examined in relation to the three instructional strategies. Multilevel analyses showed relationships between child skills and reading instructional strategies, with teachers generally using code-focused and meaning-focused strategies, as well as an appropriate level of challenge, with children who struggled less with early reading. Although teacher education was not associated with any of the reading instructional strategies, teacher experience and knowledge of reading was associated with meaning-based instruction and the level of challenge provided to struggling readers.

Although most young children learn to read through a variety of instructional strategies delivered by their classroom teacher (Foorman & Torgesen, 2001), some young children continue to struggle with learning how to read. On the 2015 National Assessment of Educational Progress, 31 percent of all fourth grade students and 67 percent of students with disabilities scored below basic levels of reading proficiency (National Center for Education Statistics, 2015). Studies have found that children who finish even their first grade year reading below grade level frequently struggle in literacy and other academic areas throughout their entire educational careers, which can ultimately lead to higher referral rates to special education, greater dropout rates, poorer employment opportunities, and lower life-time earnings (Connor, Alberto, Compton, & O'Connor, 2014; Craig & Washington, 2006; Duncan et al., 2007; Entwisle, Alexander, & Olson, 2005).

In order to prevent or remediate challenges faced by struggling readers and/or children with or at risk for learning difficulties who are not profiting from reading instruction in the general education classroom, elementary classroom teachers are frequently charged with conducting assessments and providing instruction that better meets students' needs (Foorman & Torgesen, 2001; Haager & Vaughn, 2013). Furthermore, classroom teachers are increasingly tasked with providing individualized reading instruction meant to challenge students at their appropriate skill levels (Vernon-Feagans, Kainz, Hedrick, Ginsberg, & Amendum, 2013; Connor, Piasta et al., 2009; Pressley et al., 2001; Scanlon, Gelzheiser, Vellutino, Schatschneider, & Sweeney, 2008). However, given their current qualifications and instructional skills, many early elementary school teachers are not prepared to teach struggling readers or students with or at risk for learning disabilities (McLeskey & Waldron, 2011). Although supplemental literacy interventions and professional development programs have been developed to improve classroom teacher reading instruction and thus help struggling readers (Vernon-Feagans et al., 2013; Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998; Hamilton et al., 2009; May et al., 2015; O'Connor, Briggs, & Forbes, 2013), limited empirical work has depicted how classroom teachers instruct individual struggling readers in their classrooms, and how child skill level and teacher qualifications are related to teachers' use of reading instructional strategies.

This study will strengthen the research base by providing a window into classroom teachers' instructional strategies with at-risk struggling readers in early elementary school. To do so, we created a unique reading instruction task (called the *Individualized Instruction Task*, or *IIT*) in which teachers were asked to provide a book reading and word study session to an individual student whom they identified as struggling with reading, and for whom they had spring assessment scores in decoding and vocabulary/oral language. We used this task to meet two goals. The first goal was to provide descriptive information regarding the frequency of teachers' use of word identification, decoding, and

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LEARNING DISABILITIES RESEARCH & PRACTICE

fluency strategies (*code-focused strategies*); teachers' use of meaning and comprehension strategies (*meaning-focused strategies*); and teachers' provision of instruction designed to challenge students at their skill level (*level of challenge*). The second goal was to examine associations of child reading skills and teacher qualifications with teachers' code-focused and meaning-focused strategies, as well as the level of challenge they provided to individual students. By exploring these relationships, the broader intention of this work was to contribute to an understanding of how reading instruction can be improved (e.g., in the form of pre-service coursework and/or in-service professional development, literacy coaching, and mentoring), thereby potentially altering the negative trajectory of children who struggle to develop as effective readers in early elementary school.

Meeting the Needs of Struggling Readers

Children who struggle with early reading tend to present difficulties in both print-related decoding skills as well as oral language comprehension (Foorman & Torgesen, 2001; Snow, Burns, & Griffin, 1998; Torgesen, 2002). Combined, these difficulties can prevent children from becoming fluent readers with high levels of reading comprehension (Catts, Adlof, & Weismer, 2006; Hoover & Gough, 1990; Whitehurst & Lonigan, 1998), and can lead to identification for special education related to learning and reading disabilities in later grades (Gersten & Dimino, 2006). Intensive and explicit instruction for struggling readers in decoding, repeated exposure to diverse vocabulary words within a variety of texts, modeling and practice in fluent reading, frequent opportunities to summarize and answer questions about text orally and in writing, and sufficient time to practice skills and receive feedback have been shown to be reading instructional strategies that lead to student success with reading (Arrow, Chapman, & Greaney, 2015; Juel & Minden-Cupp, 2000; Snow et al., 1998; Torgesen, 2002; Vaughn & Wanzek, 2014; Vaughn, Zumeta, Wanzek, Cook, & Klingner, 2014; Xue & Meisels, 2004).

Effective reading instruction for children who are at risk for reading problems or learning disabilities can mitigate risk, particularly when delivered early, as in kindergarten and first grade (Connor et al., 2014; Compton, Fuchs, Fuchs, & Bryant, 2006; McNamara, Scissons, & Gutknecth, 2011; Wanzek, Roberts, Al Otaiba, & Kent, 2014), and when targeted to meet the needs of individual students in the context of one-on-one instruction (Vernon-Feagans et al., 2013; Slavin, Lake, Davis, & Madden, 2011; Vaughn & Wanzek, 2014; Vellutino, Scanlon, Zhang, & Schatschneider, 2008) or small-group instruction (Dion, Brodeur, Gosselin, Campeau, & Fuchs, 2010; McAlenney & Coyne, 2015; National Reading Panel, 2000). Although identification for special education has been recommended to begin as early as kindergarten (Litty & Hatch, 2006), identification for special education related to learning and reading disabilities is typically delayed until the upper elementary grades (Balu et al., 2015). Early elementary practitioners often seek to guard against the over-referral of relatively young children for special education evaluation (Dhuey & Lipscomb, 2010). Even if children are not formally considered as having a disability, kindergarten and first grade teachers have been shown to accurately identify children who face reading or learning challenges (Speece et al., 2011). The instruction that teachers provide to struggling readers or students with or at risk for a learning disability becomes an important vehicle for student success (Connor et al., 2014; Dion et al., 2010).

Classroom Teachers and Struggling Readers

Using the classroom teacher rather than ancillary reading specialists in helping struggling readers progress in early reading has become a key feature within the Response to Intervention (RTI) framework (Fuchs & Fuchs, 2006; Fuchs, Fuchs, & Compton, 2012; Haager, Klingner & Vaughn, 2007). Particularly in under-resourced schools (e.g., Title 1 schools serving high-poverty student populations), helping the classroom teacher become more effective in reaching struggling readers and/or children with or at risk for learning disabilities can be a key strategy in improving rates of reading success (Kennedy, 2010; Slavin et al., 2011). Without effective support for classroom teachers (e.g., through pre-service or in-service professional development opportunities), however, classroom teachers may have difficulty knowing how best to provide individualized reading instruction for struggling readers (Mertzman, 2008). Teachers have reported challenges in working with students of differing skill levels, and in knowing how and to what extent to support struggling readers or children with or at risk for learning disabilities (Ganske, Monroe, & Strickland, 2003). Teachers often successfully identify the students who struggle with reading (Linan-Thompson & Hickman-Davis, 2002; Speece, Case, & Molloy, 2003); yet, being able to meet the individual needs of struggling students with appropriate levels of feedback, use of time, and application of reading strategies is much more difficult (McLeskey & Waldron, 2011). Although studies have reported the challenges general education teachers face in providing specialized instructional adaptations for struggling readers, fewer studies have explicitly examined characteristics of this instruction during one-on-one teacher-student interactions, with the current study filling this gap.

Effective Individualized Reading Instruction for Struggling Readers

A number of recent studies have tried to understand which reading instructional strategies are most effective for both non-struggling and struggling readers in early elementary school to help them progress rapidly in reading (Connor, Morrison, Fishman, Crowe, & Al Otaiba, 2013; Fuchs et al., 2012; Mathes et al., 2005). Based on this work, teachers' individualization of instruction by using *code-focused* and *meaning-focused* strategies and providing an appropriate *level of challenge* have been articulated as effective ways to improve reading, particularly for struggling readers, and are used as outcomes in the current study.

Code-Focused and Meaning-Focused Strategies

Code-focused strategies during reading instruction are commonly defined as systematic and explicit teaching of the skills needed by children to gain letter-sound and word knowledge. Word decoding is a targeted skill during instructional activities and includes blending onsets and rimes; teaching the alphabetic principle using letter-sound correspondence; and providing hands-on student activities related to sounds, letters, and words (Al Otaiba et al., 2008; Juel & Minden-Cupp, 2000; Justice, 2006; National Reading Panel, 2000). *Meaning-focused* strategies during reading instruction are commonly defined as continual exposure to texts and instructional opportunities promoting children's oral language, reading comprehension, enjoyment of book reading, and exposure to writing (Catts et al., 2006; Hoover & Gough, 1990; Morrison, Bachman, & Connor, 2005). Teachers' combination of these instructional strategies in the classroom appears to be extremely effective for improved reading (Morrison et al., 2005; Pressley et al., 2001; Pressley, Roehrig, Bogner, Raphael, & Dolezal, 2002; Rupley, Blair, & Nichols, 2009; Xue & Meisels, 2004).

Level of Challenge

In addition to *code-focused* and *meaning-focused* strategies, instruction meeting students' skill level with an appropriate *level of challenge* has been argued to be important for students' reading success (Scanlon et al., 2008). *Level of challenge* has been conceptualized as teachers' ability to meet individual students' needs and skill level using responsive, diagnostic, and scaffolded instructional strategies that challenge students to rapidly develop reading skills (Vernon-Feagans et al., 2013; Dorn, French, & Jones, 1998; Lindamood & Lindamood, 1998; Morrison & Connor, 2002; Pressley et al., 2001; Scanlon et al., 2008; Speece et al., 2003). Teachers who appropriately challenge their students in concert with students' skill levels have been shown to help their students make greater literacy growth (Connor, Morrison, & Underwood, 2007; Connor et al., 2011; Juel & Minden-Cupp, 2000).

Individualized Reading Instruction and Teacher Qualifications

In addition to child skill level, characteristics of teachers are likely also related to how they work with individual students (Entwisle, Alexander, & Olson, 2005). In this study, we explored whether malleable factors of teacher qualifications (teacher education, experience, and knowledge of reading) were related to their reading instructional strategies. These relationships have been rarely studied (Connor, Son, Hindman, & Morrison, 2005); yet, in order to improve student outcomes, understanding which qualifications of teachers are related to effective reading instructional strategies may provide a focus for future preparation, professional development programs, and interventions for pre-service and in-service teachers.

Teacher Education

Prior work has not commonly explored the association between teacher education and teachers' reading instruction. Connor and colleagues (2005) used National Institute of Child Health and Human Development (NICHD) Study of Early Child Care and Youth Development (SECCYD) data and did not find an association between first grade teachers' education level and the amount of time they spent in instructional academic content. In contrast, level of education for NICHD SECCYD first grade teachers was positively associated with time-sampled academic activities, which included reading instruction (NICHD Early Child Care Research Network, 2002). Although few studies have explored teacher education as linked to actual teacher strategies, a relationship may be expected. That is, through exposure to higher education settings, teachers with more education may have learned suitable strategies for providing an appropriate level of challenge for individual struggling readers or for using code-focused or meaning-focused strategies as compared to teachers with less education.

Teacher Experience

The relationship between teacher experience and instruction has also been underexplored. Nationally each year, over 9 percent of teachers are new to the field of teaching (Gagnon & Mattingly, 2012). Teachers with fewer years of experience tend to be less effective than their colleagues with more experience (Clotfelter, Ladd, & Vigdor, 2005), because they have fewer successful strategies for teaching reading, planning effective lessons, managing classroom time and behavior, and assessing students (Gagnon & Mattingly, 2012). Like teachers with higher education levels, teachers with more years in the classroom may have learned practical strategies leading to their adoption of code-focused and meaning-focused strategies and/or an appropriate level of challenge based on individual student skills.

Teacher Knowledge of Reading

Many of the professional development approaches to helping classroom teachers provide optimal instruction for struggling readers have attempted to increase teachers' content and pedagogical content knowledge (knowledge about the teaching of reading) in order to help teachers provide individualized reading instruction (Brady et al., 2009; Scanlon et al., 2008; Vellutino, Scanlon, Small, Fanuele, & Sweeney, 2007). Teachers' knowledge of reading may also be critical for helping struggling readers acquire word-level reading skills, which supports the development of other complex reading skills (Spear-Swerling & Brucker, 2004). Nonetheless, improved knowledge has not necessarily translated into positive changes in teacher strategies and/or child outcomes (McCutchen et al., 2002; Risko et al., 2008), though limited evidence supports this relationship for upper elementary grades (McCutchen, Green, Abbott, & Sanders, 2009). For first grade teachers, Piasta and colleagues (2009) found an

indirect association of teacher knowledge with word-reading gains. Children whose teachers had higher scores in reading knowledge, and who spent more time in explicit instruction, had higher gains in word reading. Students whose teachers had lower scores in reading knowledge, and who spent more time in explicit instruction, had lower gains in word reading. Thus, teacher knowledge as related to instruction was important for child gains, potentially because teachers with a higher knowledge of reading may be more likely to use beneficial instructional strategies for their students (Moats, 1994).

Current Study

Although studies have explored intervention contexts in which teachers provide diagnostic instruction, especially for their struggling readers (Amendum, Vernon-Feagans, & Ginsberg, 2011; Nelson-Walker et al., 2013), fewer studies have explored how teachers demonstrate reading instructional strategies with individual struggling readers when they are provided with time and materials, but not explicit training. Our research questions were designed to provide insight into classroom teachers' reading instructional strategies, as predicted by child skill level and teacher qualifications, in order to understand how these strategies may be enhanced for future teachers (e.g., through coursework, professional development, and interventions). The first research question was descriptive in order to understand the reading instructional strategies used by teachers with struggling readers in a one-on-one reading instructional task: (1) To what extent did teachers provide code-focused strategies, meaning-focused strategies, and an appropriate level of challenge? The second and third research questions explored associations among child skill level, teacher qualifications, and teachers' reading instructional strategies: (2) In analytic models controlling for child demographic characteristics and child engagement in the task, as well as accounting for the nesting of children within classrooms and schools, were child decoding skills or child vocabulary/oral language skills related to teachers' code-focused strategies, meaning-focused strategies, or an appropriate level of challenge? (3) Similarly, were teacher qualifications of education, experience, or knowledge of reading related to the extent to which teachers used code-focused strategies, meaning-focused strategies, or appropriate levels of challenge?

METHODS

Participants

This study included 41 kindergarten and 44 first grade teachers at 10 Title 1 schools in three rural school districts in the Southeastern United States. The schools were located in high-poverty areas, as represented by the percentage of students in each district on free or reduced-price lunch (i.e., falling at or below 185 percent of the federal poverty threshold), which ranged from 64–85 percent across the three districts. For the purpose of this study, teachers were asked to select two to three students whom they perceived as struggling with reading, or who would benefit from additional one-on-one instruction, for a total of 143 student participants. As seen in Table 1, all of the 85 participating teachers held bachelor's degrees, and an additional 33.3 percent held master's degrees in education. On average, teachers had nearly seven years of classroom teaching experience. Approximately half of the students were male; 24.1 percent were White, 55.6 percent were African American, 10.5 percent were Hispanic/Latino, 8.3 percent had more than one race marked, 0.8 percent were American Indian, and 0.8 percent were marked 'other' by their parent. We did not collect data on additional child characteristics, such as socioeconomic status (e.g., maternal education or family income).

TABLE 1
Descriptive Information for Individualized Instruction Task Teachers (N = 85) and Students (N = 143)

	N	*% or M*	*SD*	*Range*	
Control variables					
Grade (% first grade)	143	54.55			
Child attention (% high)	143	86.71			
Child gender (% male)	143	48.95			
Child race (% White)	143	25.17			
Child skill level					
Decoding skills (DIBELS NWF)	141	24.13	13.02	0.00	67.00
Kindergarten	65	15.65	9.28	0.00	33.00
First grade	76	31.39	11.29	0.00	67.00
Vocabulary/oral language skills (DIBELS WUF)	141	26.57	13.88	0.00	65.00
Kindergarten	65	21.88	14.26	0.00	49.00
First grade	76	30.58	12.28	0.00	65.00
Teacher qualifications					
Education (% master's)	80	33.33			
Grade-level experience (years)	80	6.83	5.90	0.00	24.00
Knowledge of reading	80	71.20	13.09	30.77	88.46

Note. DIBELS = Dynamic Indicators of Basic Early Literacy Skills; NWF = Nonsense Word Fluency; WUF = Word Use Fluency.

Procedures

Measure Collection

Parents who provided consent for their child to participate in the study completed a demographic questionnaire, which included family and child demographic information. Teachers used laptop computers to fill out questionnaires, which included items about teacher educational background, experience, and knowledge of reading.

Individualized Instruction Task

The participating teachers were part of a larger study, a randomized controlled trial (RCT) of a webcam coaching professional development intervention designed to improve the reading instructional strategies of early elementary teachers working with struggling readers. One aspect of the RCT

research design was to create a measure capturing teachers' ability to provide diagnostic one-on-one reading instruction, which we called the Individualized Instruction Task (IIT). IIT was designed as a standardized task, such that each participating teacher would select from the same set of materials and follow standardized instructions when developing and conducting a one-on-one instructional session with a struggling reader. We chose this format so that we could compare and code instructional behaviors across a range of classroom settings. For the current study, participating teachers did not take part in any intervention training or implementation prior to completing IIT.

The task was conducted over two visits. During the first visit, teachers were told that the task was about understanding how they provided instruction to individual struggling students based on their knowledge of the student as well as the student's assessment scores. Teachers were asked to plan an individualized session with each student to show how they helped each student read and understand a book (book reading), and how they provided word identification strategies appropriate for each student (word study). Once teachers selected struggling readers, research assistants administered assessments capturing children's decoding and vocabulary/oral language skills, the scores of which were provided to teachers as a way to help them choose instructional activities and strategies to use with individual selected students. In addition to assessment scores, teachers were provided with an IIT kit that contained common reading instructional materials that most teachers would use during their regular reading instruction with children. Each kit included materials for book reading and word study (e.g., writing materials, sight word lists, and book sets at a range of reading levels), and teachers were allowed to choose any of the materials from the kit as they prepared for the IIT session with each struggling reader. In order to give teachers time to prepare for the task, research assistants returned to the school approximately three days to one week after the first visit. During the second visit, teachers were video-recorded working with each student on book reading and word study for approximately 15 minutes. Teachers were able to choose whether they wanted to start with book reading or word study.

IIT Code Development

To capture teachers' instruction with individual students, the researchers developed a series of codes after the task was administered. Thus, teachers were not asked or taught to use certain strategies or instructional practices. We focused on reading instructional strategies that have been shown to demonstrate how teachers provide differing strategies based on children's range of early reading skills (e.g., Connor et al., 2011). An exhaustive review of previous research was conducted to select codes that could be coded with reliability.

IIT Code Categories

Two categories of codes were captured in IIT. The first category included *global* codes, coded as present/not present to capture types of teachers' instructional strategies during the task as a whole. Research assistants watched the entire IIT session prior to coding global codes, and were prompted to respond in a *yes, present* (1) or *no, not present* (0) format. The second category included *frequency* codes, coded in continuous 15-second blocks to capture each instructional strategy throughout the IIT session. A specialized computer program prompted research assistants to record strategies every 15 seconds. If the teacher engaged the student in a reading-related strategy at any point during a 15-second interval, the research assistants recorded this occurrence. The frequency of strategies was defined as the total number of 15-second intervals in which each strategy occurred over the total number of intervals.

IIT Training and Reliability

A senior research assistant who was involved in the code development became master coder and trained three additional research assistants, all of whom were blind to child skill level and teachers' level of qualifications. Reliability was conducted on 15 percent of video-recorded IIT sessions from each time point. Interclass correlations (ICC; Fleiss, 1981) were used to determine inter-rater reliability for the codes. The ICC is a measure of correlation and agreement of scores between raters. Reliability was characterized as excellent, $>.75$; fair to good, .40 to .75; or poor, $<.40$ (Shrout & Fleiss, 1979). All research assistants were required to meet a minimum ICC of 0.75 on codes in order to independently code IIT sessions. If this target was not met, the senior research assistant conducted additional training until reliability was reached.

Measures

Outcome Variables: Instruction Captured by IIT

For this study, and following work by Gough and Tunmer (1986), IIT frequency and global codes were combined into two indices representing different types of instructional strategies (*code-focused* and *meaning-focused*). In addition, a global code captured the *level of challenge* exhibited by teachers during their instruction with struggling readers in the one-on-one task. Details about these three outcomes are found in Table 2.

Code-Focused and Meaning-Focused Strategies

The index of *code-focused strategies* was measured from five codes (3 global, 2 frequency) captured during book reading and/or word study: global codes of whether or not the teacher (1) *emphasized letter sounds*, (2) *provided fluency practice*, or (3) *engaged student in multisensory activities*, and frequency codes of how frequently the teacher had the student (4) *manipulate materials* or (5) *decode individual words*. Based on previous research (Al Otaiba et al., 2011; Connor et al., 2013; Pikulski & Chard, 2005; Tilstra, McMaster, Van

TABLE 2
Teacher Instructional Strategies Captured in the Individualized Instruction Task (N = 143)

Index	*Codes*	*Task*	*Code Type*	*M (SD)*	*Range*
Code-Focused Strategies	1. Teacher emphasized letter sounds *Teacher emphasized letter-sounds two or more times when helping student decode words*	WS	Global	0.72 (0.45)	0–1
M = 0.00 SD = 0.15	2. Teacher provided fluency practice *Teacher allowed student to read text fluently with minimal interruptions beyond decoding and comprehension*	BR	Global	0.94 (0.23)	0–1
Min = −0.38 Max = 0.20	3. Teacher engaged student in multisensory activity *Teacher used one or more audio, visual, or tactile activities when working with student*	WS	Global	0.89 (0.32)	0–1
	4. Teacher had student manipulate materials *Teacher engaged child using books, letter tiles, or other physical literacy materials*	BR/WS	Freq.	0.10 (0.09)	0–0.37
	5. Teacher had student decode individual words *Teacher asked child to decode words within texts or letter/sounds within words*	BR/WS	Freq.	0.27 (0.13)	0–0.74
Meaning-Focused Strategies	1. Teacher asked for book summary *Teacher prompted student to summarize text plot, facts, or sequence of events after reading*	BR	Global	0.27 (0.44)	0–1
M = 0.00 SD = 0.15	2. Teacher asked questions about book *Teacher determined if student understood the word meaning and defined and elaborated unknown word(s)*	BR	Global	0.43 (0.50)	0–1
Min = –0.38 Max = 0.20	3. Teacher defined words or concepts *Teacher allowed child to independently read text silently or out loud*	BR/WS	Global	0.43 (0.50)	0–1
	4. Teacher had student read connected text *Teacher asked the student comprehension questions during book reading*	BR	Freq.	0.26 (0.13)	0–0.77
	5. Teacher had student engage in writing *Teacher engaged student in writing letters and/or words and connected text*	BR/WS	Freq.	0.09 (0.11)	0–0.46
Level of Challenge	Teacher aligns instruction with student skill level through an appropriate level of challenge	BR/WS	Global	0.77 (0.36)	0–1

Notes. ICC = Intraclass Correlation (ICC) for code-focused strategies was ICC = 0.88 and for meaning-focused strategies ICC = 0.82. BR = Book Reading; WS = Word Study; Freq. = Frequency. Fluency practice could have occurred outside of the context of book reading (e.g., a teacher writes a sentence and prompts student to read the sentence aloud).

den Broek, Kendeou, & Rapp, 2009), these items were selected as code-focused strategies, which provided students with an opportunity to work with smaller units of sounds in the contexts of books, letter tiles, or other interactive IIT materials chosen by the teacher. Reliability for the index of code-focused strategies was ICC = 0.88.

The index of *meaning-focused strategies* was measured from five codes (3 global, 2 frequency), also captured during book reading and/or word study: global codes of whether or not the teacher (1) *asked for a book summary*, (2) *asked questions about the book*, or (3) *defined words or concepts*, and frequency codes of how frequently the teacher had the student (4) *read connected text* or (5) *engaged in writing*. These items were chosen as strategies that would provide students with an opportunity to gain comprehension of and familiarity with texts and words (Al Otaiba et al., 2011; Morrison & Connor, 2002). Reliability for the index of meaning-focused strategies was ICC = 0.82.

To create each index, the five codes were first turned into *z*-scores (because the frequency and global codes were on different scales) and then averaged to create continuous scores as the outcome variables. Within each index, we expected the summative nature of the codes to indicate that the more teachers engaged students using the respective strategies, the more closely each index would approximate code-focused and meaning-focused instruction.

Level of Challenge

Based on the video-recorded IIT sessions, research assistants coded the overall *level of challenge* provided by the teacher to the struggling reader. Separately for the book reading and word study sections of the task, research assistants scored whether the level of challenge was appropriate based on the individual student's response to the teacher's instruction. During book reading, the level of challenge was scored as appropriate when book reading instruction was aligned with the child's skill level, such that the child was able to read most of the book with some mistakes and occasional scaffolding by the teacher. The teacher extended rather than supplied children's answers about the book. In contrast, the level of challenge was scored as inappropriate when the child could not read most of the words in the book and may have had trouble answering questions about the books, and the teacher thus did most of the reading and/or talking about the book. The child may have given up on reading the book or acted visibly upset by the task. During word study, the level of

challenge was scored as appropriate when the teacher might have occasionally modeled blending of sounds and provided immediate word-level feedback as necessary, but the child was able to do most of the work. In contrast, the level of challenge was scored as inappropriate when the activities were too difficult for the child, when the child made multiple mistakes and the teacher often had to intervene to correct errors, and when the teacher did most of the work. We used the mean value of the level of challenge across book reading and word study. Reliability for the level of challenge code was ICC = 0.88.

Variables of Interest: Child Skill Level

Because an important aspect of diagnostic individualized instruction is teachers' ability to meet children's skill level with appropriate reading instructional strategies, we included two child-level predictors of interest measuring decoding and vocabulary/oral language skill levels at the time of the task. We used two subtests from the Dynamic Indicators of Basic Early Literacy Skills, 6th Edition (DIBELS; Good & Kaminski, 2002): *Nonsense Word Fluency* (NWF) and *Word Use Fluency* (WUF). We chose DIBELS subtests because all of the districts had implemented the use of DIBELS assessments by classroom teachers; thus, teachers could be expected to have some familiarity interpreting the assessment results. NWF measured the student's decoding skills by having the student read as many individual letter sounds and/or nonsense words as possible within one minute. The subtest has an alternate-form reliability of .83 and predictive validity with other standardized measures ranging from 0.62 to 0.68 (Good et al., 2004). WUF measured the student's vocabulary and oral language skills by having the student use as many given target words in phrases or sentences as possible within one minute. The subtest has an alternate-form reliability ranging from .65 to .71 (Good et al., 2004), and criterion validity ranging from 0.44 to 0.48 (Kaminski et al., 2004). The continuous measures of NWF and WUF were used in analyses.

Variables of Interest: Teacher Qualifications

To understand the potentially malleable characteristics of teachers that might be related to reading instructional strategies that have been deemed important in previous literature, three teacher-level predictors of interest included *teacher education* (Darling-Hammond, 2000), *teacher experience* (Clotfelter et al., 2005), and *teacher knowledge of reading* (Carlisle, Kelcey, Rowan, & Phelps, 2011; Moats & Foorman, 2003). *Teacher education* was a teacher-reported variable dummy coded as 0 = bachelor's degree only and 1 = master's degree in addition to bachelor's degree. *Teacher experience* was a teacher-reported continuous variable representing the number of years of grade-level experience. *Teacher knowledge of reading* was a teacher-reported continuous variable measured using a multiple-choice questionnaire adapted from the Teacher Knowledge Assessment: Language and Print (TKA:LP; Connor, Piasta et al., 2009; Piasta et al., 2009), which was likewise adapted from previous work (e.g., Bos, Mather, Dickson, Podhajski, & Chard, 2001; Mather, Bos, & Babur, 2001; Moats, 1994; Moats & Foorman, 2003). Items from TKA:LP required teachers to identify technical aspects of language (such as English morphology, phonology, and orthography; sample question: *Which word contains a short vowel sound?*) and answer situational questions about reading acquisition and instruction (sample question: *You plan time during your literacy block for students to engage in a reading activity that will improve fluency. Which of the following activities would be most effective in achieving this goal?*). For the current study, we used a shortened version of the questionnaire with study teachers that excluded open-ended questions to aid ease of scoring. Twenty-six multiple-choice items were scored as correct or incorrect, and the final variable of teacher knowledge of reading was the percentage of correctly-scored items. The internal consistency estimate for this measure based on the current sample was $\alpha = .65$.

Control Variables

Several control variables were included in analysis models. *Grade* (0 = kindergarten, 1 = first grade) was included to ensure that potential relationships between teachers' instructional strategies and students' skill level were not actually a function of grade level. To account for variation in students' engagement during book reading and word work activities, research assistants provided a global code of *child attention* (0 = low, 1 = high) during the IIT session. Nonattentive behavior included students getting out of their seats, gazing away from the task at hand, playing with materials when they were not supposed to, or any action requiring a verbal redirection from the teacher. Child attention was coded as *low* (four or more displays of non-attentive behavior) or *high* (three or fewer displays of non-attentive behavior). Reliability for child attention was ICC = 0.96. *Child gender* (0 = female, 1 = male) and *child race* (0 = minority; 1 = White) were included as child characteristics influencing whether teachers provided instruction differently based on their students' demographic characteristics.

RESULTS

Descriptive Information

Data were examined using SAS 9.2 for our first research question (*To what extent did teachers provide code-focused strategies, meaning-focused strategies, and an appropriate level of challenge?*). Descriptive information about the IIT is provided in Table 2 and correlations among variables are provided in Table 3. For code-focused strategies, teachers commonly emphasized letter-sounds during word study (coded as present for 72 percent of teachers participating in IIT), provided fluency practice during book reading (94 percent), and engaged students in more than one sensory activity (i.e., tactile, audial, and visual, 89 percent). In contrast, teachers rarely had students physically manipulate materials (e.g., moving letter tiles, 10 percent) or decode individual words (27 percent) during 15-second

TABLE 3
Correlation Matrix for Model Variables (N = 143)

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*
Model predictors												
1. Grade	–											
2. Child attention	0.02	–										
3. Child gender	0.08	−0.03	–									
4. Child race	0.24**	−0.01	0.08	–								
5. Decoding	0.60***	0.11	0.04	0.06	–							
6. Vocabulary/oral language	0.31***	0.05	−0.06	0.06	0.40***	–						
7. Teacher education	0.08	0.15	−0.01	−0.02	0.01	−0.09	–					
8. Teacher grade-level experience	−0.12	0.10	0.24**	0.08	−0.13	−0.09	0.03	–				
9. Teacher knowledge of reading	0.18*	−0.03	0.01	0.25**	0.17	−0.04	0.05	−0.03	–			
Model outcomes												
10. Code-focused	0.10	−0.01	−0.08	0.03	0.05	0.20*	−0.03	−0.13	−0.01	–		
11. Meaning-focused	0.19*	−0.17*	0.05	0.07	0.23**	−0.01	0.08	0.06	0.29***	−0.05	–	
12. Level of challenge	0.30***	0.09	−0.10	−0.03	−0.43***	0.34***	0.01	0.12	0.24**	0.17*	0.29***	–

Notes: $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$. DIBELS = Dynamic Indicators of Basic Early Literacy Skills; NWF = Nonsense Word Fluency; WUF = Word Use Fluency.

intervals. Because we combined *z*-scores, the mean for code-focused strategies index was 0, with a standard deviation of 0.15 and a range of –0.38 to 0.20. The index of code-focused strategies had a significant positive correlation with children's vocabulary/oral language skills. Overall, teachers engaged in fewer meaning-focused strategies, with only 27 percent of teachers asking children for a summary of the book. Just under half of teachers (43 percent) asked questions about the book or defined words or concepts related to book reading or word study. Teachers infrequently provided students with opportunities to read connected text (26 percent) or engage in writing (9 percent) during 15-second intervals. The mean for the meaning-focused strategies index was 0, with a standard deviation of 0.17 and a range of –0.27 to 0.39. The index of meaning-focused strategies was positively correlated with children's decoding skills, grade, and teacher knowledge of reading, and negatively correlated with child attention. Finally, 77 percent of teachers were coded as providing an appropriate level of challenge during book reading and/or word study. As seen in Table 3, teachers' level of challenge was positively correlated with grade, children's decoding skills and vocabulary/oral language skills, teacher knowledge of reading, and the outcomes of code-focused and meaning-focused strategies.

Multilevel Analyses

Because students were nested within classrooms and schools, multilevel analyses were used to answer our second and third research questions (*Were child decoding skills, child vocabulary/oral language skills, or teacher qualifications of education, experience, or knowledge of reading related to the extent to which teachers used code-focused strategies, meaning-focused strategies, or an appropriate level of challenge?*) using the MIXED procedure in SAS 9.2, with random effects estimated for teacher and school intercepts. Three-level multilevel models were used for these analyses because children who participated in IIT were nested within teachers (i.e., one to two students per teacher) and teachers were nested within schools (i.e., three to seventeen teachers per school). To account for missing data within the sample (1–4 percent on outcome variables and 0–8 percent on predictor variables) and to aid model estimation, we created and analyzed multiple imputed datasets ($n = 20$) prior to analyses. Multiple imputation uses an iterative method to estimate relationships among variables for which data is available and then approximate reasonable values for missing data. Creating multiple datasets with reasonable missing data values and aggregating results from analyses using multiple datasets has been shown to provide an excellent approximation of relationships among variables (Graham, Olchowski, & Gilreath, 2007; Shafer & Graham, 2002). Outcome and predictor variables were included in the imputation model. Subsequent to imputation, all control variables and predictors of interest were centered to ensure a meaningful intercept.

Three separate analyses were conducted, one predicting to each instructional outcome (code-focused strategies, meaning-focused strategies, and level of challenge), as depicted in Table 4. For each outcome, control variables included grade, child attention, child gender, and child race. Child skill level was represented by two variables, decoding skills (DIBELS NWF) and vocabulary/oral language skills (DIBELS WUF). Teacher qualifications were represented by education, grade-level experience, and knowledge of reading. Effect sizes for significant fixed effects were calculated using Hedges' *g*, chosen due to its level of accuracy, particularly with a small sample size (Hedges, 1981; Hedges & Hedberg, 2007).

For the outcome of teacher code-focused strategies, the only significant predictor was child vocabulary/oral language skills ($B = 0.003$, $p = .003$, $g = 0.26$). Higher child vocabulary/oral language skills were associated with teachers' provision of more code-focused strategies. For the outcome of meaning-focused strategies, the control variable of child attention was significant ($B = -0.093$, $p = .015$, $g = -0.19$), implying that children who were rated as

TABLE 4
Results from Multilevel Models Predicting to Teachers' Code-Focused Strategies, Meaning-Focused Strategies, and Level of Challenge

	Code-Focused Strategies		*Meaning-Focused Strategies*		*Level of Challenge*	
	B	*SE*	*B*	*SE*	*B*	*SE*
Intercept	−0.006	0.022	−0.002	0.020	0.762***	0.033
Control variables						
Grade (first grade)	0.016	0.033	0.012	0.035	0.062	0.069
Child attention (high)	0.023	0.032	−0.093*	0.038	0.011	0.077
Child gender (male)	−0.013	0.023	0.007	0.027	−0.105*	0.053
Child race (White)	0.036	0.029	0.001	0.033	−0.105	0.065
Child skill level						
Decoding skills (DIBELS NWF)	−0.001	0.001	0.003*	0.001	0.008**	0.003
Vocabulary/oral language skills (DIBELS WUF)	0.003**	0.001	−0.001	0.001	0.006**	0.002
Teacher qualifications						
Education (master's)	−0.028	0.032	0.022	0.034	−0.008	0.061
Grade-level experience (years)	−0.003	0.003	0.003	0.003	0.015**	0.005
Knowledge of reading	0.000	0.001	0.003*	0.001	0.006**	0.002
Level Three	0.003	0.002	0.002	0.002	0.003	0.006
Level Two	0.008**	0.003	0.003	0.004	0.006	0.014
Residual	0.012***	0.002	0.019***	0.004	0.084***	0.016

Note: $^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

having poorer attention to the task received fewer meaning-focused strategies. Two predictors of interest were significantly associated with meaning-focused strategies: child decoding skills ($B = 0.003$, $p = .023$, $g = 0.23$) and teacher knowledge of reading ($B = 0.003$, $p = .015$, $g = 0.23$). Higher child decoding skills and higher teacher knowledge of reading levels were associated with teachers' provision of more meaning-focused strategies.

For the outcome of teachers' level of challenge, the control variable of child gender was significant ($B = -0.105$, $p = .049$, $g = -0.15$), implying that teachers provided a more appropriate level of challenge for girls. Four predictors of interest were significantly associated with teachers' level of challenge: Child decoding skills ($B = 0.008$, $p = .002$, $g = 0.29$), child vocabulary/oral language skills ($B = 0.006$, $p = .005$, $g = 0.22$), teacher grade-level experience ($B = 0.015, p = .004, g = 0.23$), and teacher knowledge of reading ($B = 0.006, p = .006, g = 0.23$). Higher child decoding skills and higher vocabulary/oral language skills were associated with teachers' provision of an appropriate level of challenge during instruction. In addition, teachers with more grade-level experience and a higher knowledge of reading were coded as providing a more appropriate level of challenge. Teacher education was not significantly associated with any of the three instructional outcomes.

DISCUSSION

This study contributed to our understanding of how classroom teachers in kindergarten and first grade instructed struggling readers by examining different kinds of instructional strategies that teachers used during a one-on-one literacy session. Three important findings emerged, which will be discussed in greater detail below: (1) Teachers appeared to engage students in more code-focused than meaning-focused strategies during our unique Individualized Instruction Task; (2) Teachers' code-focused and meaning-focused strategies and an appropriate level of challenge were associated with children who struggled less with reading; and (3) Teacher qualifications of experience and knowledge of reading, but not teacher education, were positively related to the three reading instruction outcomes.

In relation to the use of code-focused and meaning-focused strategies, our observational coding system showed a range in the occurrence of these strategies when teachers instructed struggling readers in a one-on-one session. Although teachers have commonly reported using both code-focused and meaning-focused strategies in the classroom (Baumann, Hoffman, Duffy-Hester, & Ro, 2000), in our study, code-focused strategies were more frequently present than meaning-focused strategies. For example, whereas over three-quarters of teachers emphasized letter sounds or provided fluency practice, less than half of teachers asked questions about the book, defined words, or asked for a book summary. Struggling readers, particularly from high-poverty backgrounds, often struggle with both word identification and oral language challenges, which can lead to long-term problems in reading comprehension (Foorman & Torgesen, 2001). Although the struggling readers in our study would likely have benefited from high amounts of both code-focused and meaning-focused instruction (Catts & Hogan, 2003), teachers appeared to be less sensitive to children's need for meaning-focused instruction, as evidenced by their provision of fewer instructional strategies that would enhance struggling readers' ability to make meaning from texts and words.

Multilevel analyses predicting to the three instructional outcomes provided additional evidence that teachers may have struggled in meeting the particular needs of their struggling readers. Although students have been shown to benefit generally from a balance of code-focused and meaning-focused instruction (Xue & Meisels, 2004), the combination of particular strategies across the course of the

school year with children of particular skill levels has been shown to lead to student gains (Connor et al., 2004; Connor, Piasta et al., 2009; Juel & Minden-Cupp, 2000). For example, in one study, children with weak decoding and vocabulary skills and/or only weak decoding skills benefited from more time in code-focused instruction. Findings from this study showed that children with higher decoding and vocabulary skills, although not formally identified as struggling readers, benefited from more time in meaning-focused instruction (Connor et al., 2004). Yet, in our observational study of teachers who engaged with students in a one-on-one reading instruction task, but were not explicitly trained in any particular instructional behaviors, teachers did not engage with students in these ways. Instead, teachers provided more code-focused strategies for children with higher vocabulary/oral language skills and, in contrast, provided more meaning-focused strategies for children with higher decoding skills. In addition, teachers' provision of an appropriate level of challenge was associated with children who scored highest on both decoding and vocabulary/oral language tests. Collectively, these findings illustrated that teachers were more likely to provide individualized instruction for students with higher skill levels. Teachers may be better able to identify appropriate instructional activities for children who struggle in one area (decoding or vocabulary/oral language), as opposed to both areas. When children struggle with both decoding and vocabulary/oral language skills, teachers may be less attuned to instruction that is too difficult or easy. These findings, which are contrary to what might be most beneficial for students (Juel & Minden-Cupp, 2000), suggest that teachers working with struggling readers in a one-on-one setting may have trouble appropriately gearing their instruction to the child's skill level. In this context of low-resourced Title 1 schools, teachers may not have had the supports they needed to help their struggling readers, a common challenge reported by teachers (Ganske et al., 2003). Overall, children who struggled most may not have received instructional strategies suited to their skill level, which has been found beneficial in both intervention and non-intervention research (Vernon-Feagans et al., 2012; Connor et al., 2007; Juel & Minden-Cupp, 2000).

In addition to child skill levels, teacher qualifications were explored in this study as potential predictors of instructional strategies. Grade-level experience was associated with level of challenge. Although more-experienced teachers have reported challenges in how to best support struggling readers (Ganske et al., 2003), teachers in our study with more years of classroom experience displayed the characteristics that we considered as providing an appropriate level of challenge for students at their individual skill level: Displaying scaffolded instruction, allowing the child to do most of the work, providing immediate word-level feedback when necessary, and aligning the book to the child's skill level. In addition, teacher knowledge of reading was positively associated with two outcomes, meaning-focused strategies and level of challenge. Teachers generally have been shown to have low levels of knowledge of teaching reading (Mather et al., 2001; Piasta et al., 2009), and teachers who participated in IIT in this study had an average of 70 percent of correct items. Teachers' higher scores on the measure of reading knowledge were associated with more meaning-focused strategies (such as asking for a book summary, defining words and concepts, or engaging students in reading and writing), as well as an appropriate level of challenge during instruction. Teachers in this study who scored higher in teacher knowledge appeared to translate that knowledge into positive instructional strategies with individual struggling readers. Nevertheless, interventions that have improved teacher knowledge of reading have not necessarily translated into higher student gains (Garet et al., 2008), and the current study was unable to explore whether teacher knowledge and/or instructional strategies were more likely to lead to student gains over time.

Finally, teacher education level was not significantly associated with any of the outcomes. Although having a master's degree may be expected to lead to higher usage of positive instructional strategies, other studies have not shown support for this connection (e.g., Connor et al., 2005; Rivkin, Hanushek, & Kain, 2005). This relationship may be influenced by the quality of the teacher preparation or master's program (Boyd, Grossman, Lankford, Loeb, & Wyckoff, 2009), in that the master's programs in which the teachers participated may not have specifically targeted promising instructional strategies in early reading. Because the relationship between reading instructional strategies and teacher knowledge of reading was significant (rather than teacher education), this may imply that opportunities for in-service teachers (e.g., professional development, literacy coaching, new teacher mentoring) may be a significant source of growth in reading instructional skills.

Limitations and Future Directions

This study employed a unique task to provide an understanding of how classroom teachers instructed struggling readers in early reading, and how child skill level and teacher qualifications were related to the provision of code-focused or meaning-focused instructional strategies or an appropriate level of challenge. Despite the importance of understanding how classroom teachers provided instruction for struggling readers, this study has a number of limitations that could be addressed in future work. We asked teachers to participate in a novel reading instructional task in which they worked one-on-one with struggling readers using a standardized kit of common instructional tools for only 15–20 minutes, which may be considered a limited instructional setting, making it difficult to generalize findings to whole group and small group instruction, which we did not capture in our study. Nevertheless, we believe this setting and measure were relevant for both classroom teachers and researchers, given the emphasis on reaching individual struggling readers and/or children with or at risk for reading disabilities using data and instructional supports. Future work may want to explore how teachers use code-focused and meaning-focused instruction, as well as an appropriate level of challenge, in an array of instructional settings, with a variety of materials, and over varying amounts of instructional time. Another avenue for future research would be for researchers to collect qualitative data, engaging teachers in a nuanced discussion of why

certain instructional choices were made. This would provide insight into teachers' perceptions and strategies for reaching struggling readers in their classrooms.

We also recognize constraints due to our study method. A small sample of teachers and students participated in the task, and a larger sample size is warranted to replicate and extend our findings. Perhaps in part because of the small teacher sample size, the internal consistency estimate for the teacher knowledge of reading measure fell below the recommended $\alpha = .70$. Thus, results related to this measure need to be interpreted with caution, and may have provided a limited estimation of teacher knowledge of reading (Bland & Altman, 1997). In addition, we did not collect pre- and posttest data for the students who participated in the IIT, as the task was only conducted with teachers and struggling readers in the spring. Thus, we were unable to test whether students benefited from the three instructional outcomes. Future studies may want to use coded observational tasks of individual student-teacher instructional sessions to determine how such sessions influence student skills.

Although we asked teachers to select struggling readers, the children they chose to participate in the task showed variability in their assessed decoding and vocabulary/oral language skills, though the majority of children (over 85 percent) were considered at risk or at some risk. The task was completed in the spring when teachers ideally would have had extensive knowledge of child skill level, and half of children were correctly identified as highly struggling. Because teacher ratings of reading problems have been shown to predict year-end child skill level (Speece et al., 2011), we have reason to believe that teacher selection of students was accurate. Further, although teachers are frequently required to assess, interpret, and provide instruction based on a screening and progress monitoring instrument such as DIBELS, our sole use of the measure to capture students' spring decoding and vocabulary/oral language skills may have been less accurate than an in-depth assessment of child skill level. Future work should consider assessments that provide additional useful information about struggling readers and/or the use of universal screening to identify struggling readers.

Finally, we recognize that including code-focused and meaning-focused strategies, as well as our classification of level of challenge during instruction, may have oversimplified what occurs during reading instruction, and may not fully capture the full range of effective reading instructional practices. In addition, the codes and indices developed to capture these instructional strategies may need future work to capture teachers' systematic instruction for struggling readers, or may need further differentiation by grade level. Additional research exploring what is happening in classrooms in the amount, type, systematicity, and quality of instruction received by children is important (Connor et al., 2004). Nonetheless, this study showed teachers were coded as using a range of strategies. Our Individualized Instruction Task is a useful way to measure how teachers provide reading instruction, particularly with children in a one-on-one setting. Helping teachers hone their instruction to best meet the needs of their struggling readers and diminish the risk for reading disabilities continues to be an important task.

CONCLUSION

Just as teachers have reported that working with struggling readers is one of their biggest challenges (Ganske et al., 2003; Mertzman, 2008), our findings suggested that although teachers were generally able to provide an appropriate amount of challenge to their students, teachers continued to face challenges in instructing struggling readers with low reading skills. Because progress monitoring with DIBELS or other measures is an increasingly common practice in early elementary school, providing support mechanisms (e.g., through communities of practice, access to technology, ongoing professional development, resource personnel, literacy coaches, and/or interventionists) to help teachers provide diagnostic individualized instruction for struggling readers is also important (Vernon-Feagans et al., 2013; Connor et al., 2014; Foorman & Torgesen, 2001). For children who have, or who are at risk for, learning disabilities, providing high-quality, challenging, and individualized instruction can be considered to be particularly vital for their long-term academic success. If teachers are not able to provide children with high-quality instruction, and incorrectly identify children as needing (or not needing) supplemental instruction, students' general education and/or special education experiences tend not to serve them at their appropriate skill level and may not enhance their reading abilities (Hill et al., 2012).

Early literacy interventions that support teachers' understanding of variability in student skill level and teachers' responsiveness in appropriately and diagnostically engaging their students who struggle with reading are needed. Providing interventions with students who may be at risk for reading and/or learning disabilities during kindergarten and first grade is especially important in preventing subsequent reading difficulties for students (Connor et al., 2014). Because teachers are frequently tasked with providing higher-intensity interventions for students who have the greatest need, districts and schools share responsibility for making sure teachers have the expertise needed to both implement diagnostic interventions and adjust their instruction to meet students' particular needs (Hosp, Huddle, Ford, & Hensley, 2016). Teacher support systems, high-quality implementation of reading instruction and interventions, and high levels of teacher expertise for teaching reading are important mechanisms by which children with or at risk for reading or learning disabilities may experience success in early elementary school and beyond.

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