Peer-Assisted Learning Strategies:

Promoting Word Recognition, Fluency, and Reading Comprehension in Young Children

Douglas Fuchs and **Lynn S. Fuchs,** *Peabody College of Vanderbilt University*

In this article, we summarize a good portion of the CASL research program on reading in the early grades. We first describe investigations conducted in kindergarten, where our focus was on the development of decoding and word recognition. Then we discuss studies conducted in first grade, where we continued to emphasize decoding and word recognition but expanded our focus to include fluency and comprehension. In explaining the methods of these studies, we provide the greatest detail for the first study, at kindergarten. Our description of subsequent studies is more concise because they share many methodological features with the first kindergarten study. Before closing, we offer several conclusions about practice and future research.

Many societal forces as dissimilar as increasing rates of immigration (cf. Hodgkinson, 1995), de-tracking (e.g., Braddock et al., 1992), and inclusion have converged to make public school classrooms increasingly diverse—ethnically, linguistically, and academically (D. Fuchs & Fuchs, 1994). Ethnic diversity and linguistic differences have obvious and important value to school communities. Academic diversity, by contrast, creates many challenges, and the degree of academic diversity in the typical intermediate-grade urban classroom is striking: In an average class of 22 students, the number of words read correctly in 1 minute ranges from 0 to 183 (L. S. Fuchs & Fuchs, 2003). This wide range in reading skill strains the capacity of most teachers to address students' learning needs. Many teachers respond to such diversity by ignoring it. That is, their lessons are typically designed for and directed to the group of students performing at the middle of the class (e.g., Baker & Zigmond, 1990; D. Fuchs, Fuchs, Mathes, & Simmons, 1997; L. S. Fuchs, Fuchs, Phillips, & Simmons, 1993; McIntosh, Vaughn, Schumm, Haager, & Lee, 1993). The needs of below-average and above-average children often go unmet. This helps explain why so many children read poorly and why so many are eventually labeled learning disabled (Denton, Vaughn, & Fletcher, 2003).

An important remedy is differentiated instruction. How to help teachers differentiate their instruction is surely one of the most difficult and important challenges facing public schools in the 21st century. One promising approach is peer mediated instruction, whereby children work together to support each other's learning. An advantage of peer mediation is that subgroups of children in the same classroom can operate on different levels of curricula and use different instructional procedures. Teachers, in effect, can oversee many lessons simultaneously and address a broader range of students' educational needs, including those of many English-language learners and students with disabilities. Research in the elementary grades shows that children's reading competence improves when they work with each other in a cooperative and structured manner (e.g., Greenwood, Delquadri, & Hall, 1989; Rosenshine & Meister, 1994; Stevens, Madden, Slavin, & Farnish, 1987).

Beginning in 1989, our research group at Vanderbilt University partnered with the Metro-Nashville Public Schools and other local districts to develop Peer-Assisted Learning Strategies in reading (PALS-R) and math (PALS-M) in Grades 2 through 6. (See D. Fuchs and Fuchs, 1998, for a description of the Vanderbilt–public school partnership.) The general purpose of PALS-R (hereafter, simply PALS) is to strengthen teachers' capacity to meet the academic needs of a broader range of children. More specifically, its focus at Grades 2 through 6 is the development of reading fluency and comprehension. In creating PALS, we incorporated empirically validated, state-of-the-art instructional practices, and we situated these activities in a classroom organization that reorganized students into pairs for part of the day. This reorganization permits teachers to differentiate instruction for students at different skill levels by varying the difficulty of reading material, by increasing the degree of structure for some pairs, or by varying the pace with which pairs proceed through lessons.

In conducting PALS in Grades 2 through 6, teachers implement three 35-minute sessions each week with all children in the class (see D. Fuchs, Fuchs, & Burish, 2000; D. Fuchs, Fuchs, Thompson, Al Otaiba, Yen, & Yang, 2000). This rep-

Address: Douglas Fuchs, Box 328 Peabody, Vanderbilt University, Nashville, TN 37203; e-mail: doug.fuchs@vanderbilt.edu

resents 20% to 25% of teachers' reading/language arts time. Teachers train students to implement PALS in seven 45-minute to 60-minute lessons. Every student in the class is paired. Each pair includes a higher and lower performer. The teacher creates the pairings by ranking the class on reading competence, halving the rankings at the median, and combining the highest performer from the top half with the highest performer from the bottom half and so on. Tutoring roles are reciprocal, but the higher performing student reads first for each activity to model desired performance. Both students in a pair read from material appropriate for the lower reader. PALS activities accommodate narrative or expository material. Pairs are assigned to one of two teams for which they earn points. Points are awarded for completing activities correctly and for exhibiting good tutoring behavior. Each pair keeps track of points on a consecutively numbered scorecard, which represents joint effort and achievement. At the end of the week, each pair reports its total; the teacher sums each team's points; and the class applauds the winning team. Every 4 weeks, the teacher assigns new pairs and teams. Thus, the PALS motivational system combines competitive and cooperative structures.

Every session includes three PALS activities. First, with *partner reading,* each student reads connected text aloud for 5 minutes. The higher performer reads first; the lower performer rereads the same material. Then, for 2 minutes, the lower performer retells the sequence of what occurred. The second PALS activity is *paragraph shrinking.* Students read orally one paragraph at a time, stopping to identify its main idea. Tutors guide main idea identification by asking readers to identify who or what the paragraph is mainly about and the most important thing about the "who" or "what." Readers combine this information to form a main idea statement of 10 or fewer words. After 5 minutes, students switch roles. The last activity, *prediction relay,* extends paragraph shrinking to larger chunks of text and requires students to make and check predictions. For each half page, the reader predicts what will be learned next; reads the half page aloud as the tutor corrects errors; (dis)confirms the prediction; and states the main idea. After 5 minutes, students switch roles.

Over a decade, we empirically tested the value added by various components of PALS at Grades 2 through 6, and we evaluated their combined effects in large randomized field trials (for a description of the research program conducted at Grades 2–6, see L. S. Fuchs & Fuchs, 2000). In one such study, D. Fuchs et al. (1997) randomly assigned 40 teachers to PALS or no-PALS conditions. All 40 teachers allocated comparable time to reading instruction. For 15 weeks, 20 teachers implemented PALS classwide. In each (PALS and no-PALS) classroom, D. Fuchs et al. collected data on only three students, representing three types of students: reading-disabled students, nondisabled low achievers, and average achievers. Fidelity data were collected three times by direct observation and indicated accurate implementation. Students' reading performance was tested before and immediately following treatment, and these data were analyzed using treatment, trial, and student type as factors.

Compared with conventional (no-PALS) instruction, PALS students improved more in reading, and their superior growth was *not* mediated by student type. That is, reading-disabled students, nondisabled low achievers, and average achievers in PALS classes outperformed their respective counterparts in no-PALS classrooms. Effect sizes were 0.32 for reading fluency and 0.56 for comprehension, which compare favorably with more comprehensive and time-consuming versions of cooperative learning. As reported by Slavin (1994), the median effect size for 52 studies of cooperative learning lasting more than 4 weeks was 0.32, a figure identical to the one reported for reciprocal teaching by Rosenshine and Meister (1994). In a more recent investigation of PALS in Grades 2 through 6 (e.g., Saenz, Fuchs, & Fuchs, in press), effect sizes for high achievers and English-language learners were even larger than those obtained by D. Fuchs et al. (1997).

Center on Accelerating Student Learning (CASL)

Supported by CASL funding, we shifted the focus of our PALS research from Grades 2 through 6 to kindergarten and first grade. At kindergarten, we developed procedures to promote decoding and word recognition skills, an unusual focus for such young children in this country. At first grade, we targeted the development of fluency and reading comprehension—again, rather unusual objectives for intervention, because most first graders have not yet mastered relevant lower order skills. This effort to move challenging skills downward in the curriculum is a thread that runs through much of CASL's work. It is reflected in Joanna Williams's research on comprehension of expository text for low-performing and reading-disabled second and third graders (e.g., Wilder & Williams, 2001); in Steve Graham and Karen Harris's work on different genres of written expression for at-risk and writing-disabled second and third graders (e.g., Graham & Harris, 1997); and in Lynn Fuchs's exploration of mathematical problem solving for children with math disability and their typically developing classmates at third grade (e.g., L. S. Fuchs et al., 2003).

Our research on reading at kindergarten and first grade illustrates two additional common interests of CASL researchers. First, an important goal was to produce interventions for real-world application. Toward that end, our PALS research (a) was conducted in real classrooms, using methods that could be implemented by teachers with virtually all of their students, and (b) relied on scripted manuals, written in consultation with participating teachers, to facilitate dissemination of the intervention for broader teacher use. Second, CASL intervention research tends to rely on multiple instructional components, designed to address the many difficul-

ties children with disabilities often experience. In developing a PALS fluency intervention at first grade, for example, we borrowed self-regulated learning strategies developed by Graham and Harris (1997).

In this article, we summarize a good portion of the CASL research program on reading in the early grades. We first describe investigations conducted in kindergarten, where our focus was on the development of decoding and word recognition. Then, we discuss studies conducted in first grade, where we continued to emphasize decoding and word recognition but expanded our focus to include fluency and comprehension. In explaining the methods of these studies, we provide greatest detail for the first study at kindergarten. Our description of subsequent studies is more concise because they share many methodological features with the first kindergarten study. Before closing, we offer several conclusions about practice and future research.

Kindergarten PALS: Decoding and Word Recognition

In creating a PALS curriculum in Grades 2 through 6, we assumed most students possess a basic capacity to decode and recognize words. Thus, we emphasized fluency building and reading comprehension. To extend PALS downward from Grades 2 through 6 to kindergarten, we began with the obvious: Many 5-year-olds have few reading skills. In reorienting our effort, we looked to the scientific literature on emergent literacy and beginning reading, where we found a strong emphasis on phonological awareness (e.g., Bradley, 1998; Kantrowitz & Underwood, 1999; Snow, Burns, & Griffin, 1998). This interest is based on an impressive amount of correlational (e.g., Juel, Griffith, & Gough, 1986; Lundberg, Olofsson, & Wall, 1980; Stanovich, Cunningham, & Cramer, 1984) and experimental evidence (e.g., Brennan & Ireson, 1997; Content, Kolinsky, Morais, & Bertelson, 1986; Cunningham, 1990; Fox & Routh, 1984; Hatcher, Hulme, & Ellis, 1994; Lundberg, Frost, & Petersen, 1988; Olofsson & Lundberg, 1983; Rosner, 1974; Schneider, Kuspert, Roth, & Vise, 1997; Torneus, 1984; Vellutino & Scanlon, 1987; Wallach & Wallach, 1976; Weiner, 1994; Williams, 1980) linking phonological awareness to reading. The experimental work indicates phonological awareness can be trained; training can produce positive, albeit small, effects on reading development; and its influence can be enhanced when integrated with letter–sound or beginning reading instruction. Such findings have led many (e.g., Adams, 1990; Juel, 1988; Snow et al., 1998) to recommend to practitioners that they include phonological awareness training into their reading-readiness instruction before first grade.

Many researchers who have implemented phonological awareness training studies have taught phonological awareness in isolation, reflecting an assumption that it is prerequisite to reading and, as such, it should be addressed prior to rather than concurrent with formal reading instruction (e.g., Brennan & Ireson, 1997; Lundberg et al., 1988). And yet, considerable evidence exists for combining the two (e.g., Ball & Blachman, 1991; Bryant & Bradley, 1985; Byrne & Fielding-Barnsley, 1993; Hatcher et al., 1994; Williams, 1980). A related and logical question, infrequently asked by researchers, is whether phonological awareness training is necessary at all; that is, must phonological awareness be trained directly or can it be addressed indirectly through beginning, code-based instruction. In other words, can beginning decoding instruction kill two birds (phonological awareness and decoding) with one stone? We determined to examine this theoretically intriguing and practically important question in a series of three year-long studies in kindergarten.

Kindergarten Study 1

Study Design

In our first investigation (D. Fuchs et al., 2001; Fuchs, 2002), we examined the effects of decoding instruction combined with phonological awareness training versus the effects of phonological awareness training alone. There were three study groups. Group 1 participated in teacher-led phonological awareness (PA) training. Group 2 received a combination of teacher-led PA and our peer-mediated intervention that emphasizes decoding and does not explicitly address phonological awareness (PALS-DE). Group 3 consisted of controls, whose teachers performed their typical preliteracy instruction, which tended to focus on whole-language activities and letter names.

To strengthen the internal validity of the study, we (a) randomly assigned kindergarten teachers (and their intact classes) within schools to the three study groups; (b) collected treatment fidelity data at multiple points on teachers and students; (c) observed teachers in all classrooms to describe their general literacy programs; (d) used well-regarded measures of phonological awareness, beginning reading, and spelling; (e) required the PA and PALS-DE treatments to run 20 weeks and 16 weeks, respectively; and (f) tested participants prior to treatment, immediately after treatment, and 5 months following treatment in October of the next school year. To strengthen generalizability of findings, we recruited a relatively large number of schools ($N = 8$), kindergarten teachers ($N = 33$), and children ($N = 404$). Half the schools were Title I (high-poverty) schools, and half served mostly middle-class children. In each of the 33 classrooms, we collected data on low-achieving, average-achieving, and high-achieving students, 25 of whom had disabilities.

Further, we explored the specificity of treatment effects. We asked (a) whether children who participate in PA, but not in decoding instruction and practice, demonstrate improved performance on phonological awareness measures but not on reading or spelling measures; and (b) whether students in both PA and decoding instruction and practice (i.e., PA + PALS-DE) show growth on phonological awareness, reading, and spelling measures. Although such results may seem self-evident

on the basis of research showing "you get what you teach," investigators in prior research had not examined specificity of treatment effects with respect to PA and decoding instruction in kindergarten, especially when, as in our case, teachers conducted the interventions.

Treatments

Our teacher-led PA treatment was based on Rollanda O'Connor's *Ladders-to-Literacy* program (O'Connor, Notari-Syverson, & Vadasy, 1998b). With O'Connor's input, we chose 15 activities from more than 80 lessons in the Ladders workbook. These 15 activities were selected to help teachers promote phonological awareness among their students and to differentiate it from PALS-DE. Of the 15 Ladders activities, 10 were designed to stimulate word and syllable awareness, rhyming, first-sound isolation, onset–rime-level blending, and sound segmentation. Six of the 10 activities were chosen to promote the blending or segmenting of sounds in consonant-vowel-consonant words; only one activity required manipulations of printed letters. Teachers conducted the 10 activities three or more times during two nonconsecutive weeks. The remaining five Ladders activities were journal writing, "Letter Sound of the Week," "Morning Message," nursery rhymes and poems, and shared storybook reading. Only journal writing and "Morning Message" presented students with printed letters. Each of these five activities was conducted at least once per week for the entire implementation period. All 15 of our PA activities were teacher led, were directed to the whole class, and required 5 to 15 minutes each day of implementation. The maximum time teachers devoted to PA each week was 45 minutes (15 minutes × 3 days), or 10% of their reading/language arts program. Teachers conducted the PA treatment for 20 weeks. O'Connor, Notari-Syverson, and Vadasy (1996, 1998a) reported that Ladders improved the early literacy skills of special-needs students and nondisabled low-income children. However, O'Connor et al. used 25 activities, in contrast to our 15, and their activities deliberately placed greater emphasis on 3-phoneme segmentation and blending tasks.

The other experimental condition was a combination of PA + PALS-DE. PALS-DE requires children to work in dyads with same-age peers on up to 51 lessons. With the *Rapid Letter Naming Test* (RLN), a predictor of future reading performance (e.g., O'Connor, Jenkins, & Slocum, 1995; Torgesen, Wagner, & Rashotte, 1997), we paired the highest scoring student in each class with the lowest scoring student, the second-highest scoring student with the next-to-last scoring student, and so on. If a teacher believed a pair to be socially incompatible, the pair was reassigned. Each student in each pair took a turn as reader (tutee) and coach (tutor). Pairs remained together for 4 to 6 weeks, at which point the teacher named new pairs. Teachers trained their students to work productively and cooperatively. Before each PALS-DE lesson, to increase the likelihood students would experience success, teachers spent about 5 minutes modeling new letter sounds and sight words. Teachers conducted PALS-DE three times per week for 16 weeks. Sessions lasted about 20 minutes beyond the brief teacher-led instruction. This represented 10% to 15% of teachers' reading/language arts time. Thus, the combined PA + PALS-DE treatment accounted for a maximum of 20% to 25% of teachers' reading/language arts program. This was more than double the time of the PA treatment. Nevertheless, the total amount of reading/language arts time for students in the two treatment groups was virtually identical.

In kindergarten PALS-DE, "What Sound?" (WS) is the first of two activities. Its purpose is to help students learn the correct sounds of all of the alphabet letters except *x*. In this activity, the coach points to a printed letter and asks, "What sound?" The reader responds, after which the coach provides praise for an appropriate answer or a standard correction for an incorrect answer. The coach's correction is as follows: "Stop. You missed that sound. That sound is [letter sound]." The coach again asks, "What sound?" After a correct response, the coach says, "Good. Read that line [of letters] again." There are 51 WS lessons printed on separate, 9-in. × 11-in. sheets of paper. Each sheet contains four lines of upper- and lowercase letters, with six letters per line. Interspersed among the letters are prominent black stars. When the pair gets to a star, the coach tells the reader, "Good job!" A new letter sound is introduced in approximately every other lesson. The order in which letters are introduced in the WS lessons and the procedure and layout of the lessons were influenced by Carnine, Silbert, and Kameenui (1990).

The second PALS-DE activity is called "What Word?" (WW). It requires children to read aloud sight words, decodable words, and simple sentences. Reading orally permits a child's partner and teacher to monitor word identification skill and to present corrective feedback when errors are made. The sight words are *I, the, is, was, on,* and *has*. Teachers introduce the first of them in Lesson 29 and new ones at an approximate rate of one every three lessons. On the same lesson sheet containing the activity, the coach points to newly presented and previously learned sight words and asks, "What word?" The correction procedure is similar to the one used in the WS activity. Also on the same lesson sheet are decodable words (i.e., words that can be sounded out with letter sounds practiced in earlier lessons) representing as many as five word families: *at, an, ap, ad,* and *am*. Each letter of each decodable word is placed in a "sound box" (Elkonin, 1973). The coach says, "Read the word slowly." The reader slowly says the letter sounds as he or she touches the individual sound boxes. Then the coach asks, "What word?" Simple sentences (still on the same lesson sheet) are composed of the sight words and decodable words learned in previous WW lessons. When the reader misreads a sentence, the coach applies a correction procedure similar to those used in connection with the reading of sight words and decodable words in the WS activity. With PA + PALS-DE, teachers also conducted the PA lessons with the same frequency and degree of integrity as did the PA-only teachers.

Data Collection

We pre- and posttested a purposive sample of 14 children from each classroom: four "high performers," four "average performers," and six "low performers" (including all 25 children with disabilities across the 33 classes) as determined by the children's RLN performance and confirmed by teacher judgment. The measures included two phonological measures (segmentation and blending) and four reading and spelling measures (rapid letter sounds, Word Attack and Word Identification subtests of the *Woodcock Reading Mastery Test–Revised,* and the Spelling subtest of the *Wechsler Individual Achievement Test*).

Findings

On posttreatment phonological awareness (segmentation and blending) tasks, the PA and PA + PALS-DE students performed comparably, and both groups reliably outperformed controls. Across the segmentation and blending tasks and across low, average, and high performers, effect sizes for the PA versus control comparison ranged from 0.46 to 1.30. For the PA + PALS-DE versus control contrast, effect sizes ranged from 0.45 to 2.10. On posttreatment reading and spelling measures, by contrast, PA + PALS-DE students outperformed PA and control students. Across tasks and low, average, and high performers, effect sizes for the PA + PALS-DE versus control comparison ranged from 0.08 to 1.42; for PA + PALS-DE versus PA, effect sizes ranged from 0.02 to 1.96. PA and control students' performance was similar on the reading and spelling measures.

This distinct pattern of findings—where PA and PA + PALS-DE students performed better than controls on phonological awareness tasks, and where PA + PALS-DE students performed best on reading and spelling measures—held not just for low, average, and high performers but also in high-poverty and middle-class schools. The specificity of these treatment effects argues persuasively that (a) kindergarten teachers can indeed teach their students phonological awareness and (b) combining PA with decoding instruction and practice strengthens beginning reading performance more than does PA alone. Further, the PA + PALS-DE children's stronger performance signifies more than a statistically significant difference. As indicated by related effect sizes, it represents an educationally important advantage. Such findings are in line with Hatcher et al.'s (1994) conclusion that "working on phonological skills in isolation is not an optimal method for improving literacy skills" (p. 54).

Another noteworthy feature of this study is the peer-mediated nature of PALS-DE. Peer mediation strengthened the practicality of our early reading program because, when students learned the routine, they were largely responsible for implementation. Of course, teachers introduced new letter sounds and sight words before PALS-DE sessions; and they monitored the tutoring, encouraging cooperation and providing support when both tutor and tutee required help (as when, for example, they confronted an unfamiliar word). However, teachers accomplished most of this "off stage." Many teachers said PALS-DE provided them with rare opportunities to observe and reflect on students' behavior and reading performance.

Moreover, PALS-DE's structured, reciprocal, one-to-one interaction between partners permitted frequent opportunity to respond, facilitated immediate corrective feedback, increased academic engaged time, and offered social support and encouragement—features that comply with generally accepted principles of effective instruction. So the peer-mediated nature of PALS provided teachers with an organizational strategy for delivering decoding instruction and facilitating practice that was intensive and individualized to a degree that would have been virtually impossible to replicate with teacher-led instruction (see Juel, 1996). We highlight peer mediation because we believe it has strong potential as a general approach for accelerating student achievement and because researchers and practitioners use it infrequently, especially with young children.

Kindergarten Study 2

In our second kindergarten study (D. Fuchs et al., 2005b), we extended our understanding of kindergarten PALS-DE by examining its effects when used alone. Specifically, we contrasted PALS-DE alone to a combination of PA+ PALS-DE and to controls using a randomized controlled field trial with 33 teachers and 400 kindergartners. On both phonological awareness measures and reading/spelling measures, PALS-DE and PA + PALS-DE groups performed comparably and both were better than controls. Effect sizes for PALS-DE students were similar to those for PA + PALS-DE children, suggesting that the teacher-led PA component was unnecessary to effect better phonological awareness and reading growth. In short, kindergarten PALS-DE alone produced effects that were (a) comparable to PA + PALS-DE, (b) statistically significantly superior to controls, and (c) educationally important.

In combination, then, Study 1 and Study 2 provided evidence that PALS-DE produced important early reading outcomes among kindergarten children. However, this interpretation was necessarily complicated and perhaps compromised by the fact that, whereas the PA treatment was teacher-led, the PALS-DE treatment was peer-mediated. This methodological inconsistency gives rise to the possibility that peer mediation, with its intensity of practice, task engagement, and immediate feedback, was the "active ingredient" producing differentially strong reading outcomes, not the decoding treatment per se. Therefore, in our Study 3 (D. Fuchs et al., 2005b), we addressed this concern by contrasting a new *peer-mediated* phonological awareness training program (PALS-PA) with (a peer-mediated) PALS-DE.

Kindergarten Study 3

Our new PALS-PA included five activities, each of which was formatted on a one-page lesson sheet. Each of the five activities was designed to develop one phonological skill: recognizing the first sound in words, rhyming, syllable segmentation, recognizing the last sound in words, or blending. The activities were presented as lessons, requiring 5 to 10 minutes per day; they were implemented 1 week at a time; and they were repeated two or three times across the duration of the study.

A total of 32 teachers in 10 schools participated in Study 3. Within each school, we randomly assigned teachers to one of four conditions: PALS-DE + PALS-PA (peer-mediated decoding and peer-mediated phonological awareness), PALS-PA alone, PALS-DE alone, and controls. Regardless of condition, each session began with 5 minutes of teacher-led instruction that introduced children to new content in the day's lesson. As with D. Fuchs et al. (2001), we assessed 4 high performers, 4 average performers, and 6 low performers per class during pre- and posttesting, for a total sample size of 442. Treatments were conducted for 20 weeks; strong fidelity was documented at multiple points; and the outcome measures were the same as in D. Fuchs et al.

What did we find? When it comes to kindergarten reading instruction, results indicated you "get what you teach." Regarding phonological awareness measures, students participating in PALS-PA outperformed those who did not (effect sizes ranged from 0.20 to 0.55). On reading and spelling measures, students in PALS-DE performed statistically significantly stronger than those who did not get PALS-DE (effect sizes ranged between 0.98 and 1.25). We concluded that intensive, explicit, and systematic decoding instruction and practice was the "active ingredient" in effecting early reading outcomes. For many children, explicit phonological awareness training without decoding instruction is insufficient. This pattern held across high-poverty and middle-class schools and across a wide range of learners, including those who began kindergarten as (a) low performers with and without disabilities, (b) average performers, and (c) high performers.

In addition to findings indicating that PALS-DE may be *necessary,* PALS-DE also appears *sufficient*. That is, explicit phonological awareness training may not be necessary—indeed, may be redundant—when young children participate in intensive, explicit, and systematic decoding instruction. Such a finding, if replicated by others, points the way to development of more effective and efficient early reading programs.

We also drew two additional lessons from our CASL research program at kindergarten, the first of which concerns PALS feasibility. PALS can help transform "laboratory knowledge" (i.e., knowledge obtained in contrived, highly controlled settings about phonological awareness and decoding principles) into practical programs that real teachers in real classrooms can use to teach young children to read. In large-scale, field-based experiments, teachers have been observed to use PALS accurately, and on questionnaires requesting anonymous responses, they describe themselves as very satisfied with the intervention. Several features of PALS seem to promote fidelity of implementation and user satisfaction. The materials are concrete, specific, and user-friendly, important criteria if new practices are to be implemented (McLaughlin, as cited in Gersten, Vaughn, Deshler, & Schiller, 1995). In addition, teachers find the PALS manual to be complete in guiding implementation, and there is no need for them to develop materials or devote more time to reading instruction. Also, the PALS program supplements, rather than supplants, teachers' ongoing reading programs. Therefore, its adoption does not require radical changes in methods or materials.

A second lesson from our work at kindergarten is this: One should not underestimate the capacity of young children, including those as young as 5 and 6 years, to work productively, constructively, and supportively with each other to enhance their own learning.

First-Grade PALS: Reading Fluency and Comprehension

First-Grade PALS Activities

First-grade PALS is structured similarly to kindergarten PALS-DE. In each classroom, students are divided into pairs based on RLN performance. One higher and one lower achieving student constitute each pair. The higher performing student is always the Coach (tutor) first; when the pair completes an activity, students switch roles and repeat the activity. Partners change every 4 weeks. Before each peer-mediated session, the teacher conducts 5 minutes of instruction, introducing new sounds and sight words and leading a brief segmenting and blending activity. Then, students begin their PALS work, which comprises *sounds and words activities* and partner reading.

Sounds and Words. The first sounds and words activity, which lasts 3 minutes, is a letter–sound correspondence task. The coach points to a letter and prompts the reader to say its sound. If the reader makes a mistake or does not know the sound of a letter, the coach uses a correction procedure. When the reader has said all of the sounds, the coach marks a happy face on the lesson sheet and also marks 5 points on a point sheet. Then, partners switch roles and repeat the activity.

The second sounds and words activity involves "sounding out"; that is, blending the 8 to 10 words reviewed during teacher-directed instruction. The coach prompts the reader to sound out a word; then the coach says, "Say it fast," and the reader responds by reading the word. If the reader makes a mistake, the coach uses a correction procedure. When all 8 to

10 words have been blended, the coach marks a happy face on the lesson sheet and awards 5 points on the point sheet. Then partners switch roles and repeat the activity. Sounding out lasts 5 minutes.

The third sounds and words activity involves the reading of sight words. The coach points to each word and prompts the reader to read it by saying, "What word?" If the reader says the wrong word, the coach uses a correction procedure. The coach marks a happy face and marks 5 points at the end of the activity. Partners switch roles and repeat the task. Students read sight words in this fashion for 4 minutes.

In the fourth sounds and words activity, students practice reading both decodable words and sight words in short stories. Before they read the story, the teacher introduces new "rocket" words and reviews old rocket words. Rocket words (e.g., *playground, birthday party,* and *office*) were added to the stories to increase interest value. Next, the teacher reads the story to the students, who follow along on their lesson sheets. The teacher emphasizes the importance of reading quickly and correctly. Coaches then prompt their readers to read the story. Coaches use a correction procedure for errors. When the story has been completed, the coach marks a happy face and marks 5 points; partners switch roles and repeat the activity. The story activity lasts 5 minutes. Coaches and readers mark a star on a chart if they have read the story the number of times the teacher designates (never to exceed three times per session). When students have marked all the stars on the chart, they receive a bookmark and a new chart.

Partner Reading. After 4 weeks, during which pairs work independently of their teacher on sounds and words activities, 10 minutes of partner reading is added. In partner reading, students apply their decoding skills and sight-word knowledge to connected text appropriate to their reading level. Teachers train students in two 20-minute sessions. The coach first reads the title of the book, pointing to each word. The reader follows suit. The coach next reads a page of the book, pointing to each word. On the same page, the reader does likewise. Partners proceed through the book in this manner, mark 5 points when they complete the book, switch roles (coach becomes reader and vice versa), and repeat the process. Each book is read four times before partners trade it in for a new one.

During first-grade PALS, students mark and earn points for their team. The class is divided into two teams. Each pair on a team has a point sheet with boxes numbered from 1 to 200 on it. For every PALS activity they complete, the pair marks a happy face on their lesson sheet and marks 5 points on their point sheet. While monitoring students, the teacher awards additional points when students follow PALS rules, read accurately, and use appropriate correction procedures. At the end of every week, each pair reports the number of points earned. The first-place team is cheered, then the second-place team is applauded for good effort. Teams change every 4 weeks.

In previous work (Mathes, Howard, Allen, & Fuchs, 1998), first-grade PALS had been shown to produce superior decoding and word recognition among low performers (with and without disabilities), average performers, and high performers, in both high-poverty and middle-class schools. In the CASL research program, we were interested in incorporating higher order skills into the first-grade PALS program. That is, we wished to determine whether PALS could be modified to enhance first-grade children's fluency and comprehension.

Fluency Studies

Repeated reading is an effective practice for promoting reading fluency (Yang & Fuchs, 2004). However, the research literature suggests it requires one-to-one adult supervision, making it difficult to implement in classrooms. Perhaps for this reason, it has received relatively little attention as a classwide developmental reading practice. Rather, practitioners tend to use it, if they use it at all, to promote fluency among struggling readers, including those with reading disabilities. We were interested in whether PALS might be used to facilitate the classwide use of repeated reading, as a developmental, rather than as a remedial, practice for promoting reading fluency among a broad range of learners.

"Speed-Reading Game." Toward that end, we designed a *speed-reading game,* which involves timed, repeated readings. During the first 12 weeks of PALS, speed reading was conducted during the sight word activity of sounds and words; for the remaining 10 weeks, it was conducted during the short-story reading in sounds and words.

The speed-reading game requires the teacher (a) to remind students about the importance of reading quickly and correctly, (b) to watch the clock as students read, and (c) to direct students to return to the same starting point after each repeated reading. For the sight words, each repeated reading is 30 seconds; for the short stories, 60 seconds. First, coaches start at the beginning of the relevant sounds and words section. Readers listen and apply a correction procedure as needed. At the end of each timed segment, the coach marks his or her initials next to the last word read. The goal is for the coach to increase this number of words read during the second or third timed segment. After the coach's turn, the reader reads three timed segments while the coach listens and corrects performance. If students read more words in the second or third trial, they mark a star on a chart. When all the stars on the chart are marked, students receive a bookmark and a new chart.

Method. We conducted two studies at first grade (D. Fuchs et al., 2005a) to assess the value of this classwide repeated reading strategy. The design of the two studies was analogous, and similar to the study methods described in D. Fuchs et al. (2001). In each investigation, we recruited 30 first-grade teachers from four Title I and four non–Title I schools. Within schools, we randomly assigned classrooms to three condi-

tions: control (no-PALS), PALS alone, and PALS with repeated reading. In each classroom, for pre- and posttesting, we identified 16 students (8 low performers, 4 average performers, and 4 high performers on RLN with teacher confirmation).

A total of 385 children completed posttesting, of whom 37 had a disability. Teachers conducted PALS (with and without repeated reading) for 20 weeks. Fidelity of students' and teachers' implementation, documented at multiple points, was strong. Outcome measures included letter sound fluency, segmentation, blending, Word Attack and Word Identification subtests of the *Woodcock Reading Mastery Tests, Wechsler Individual Achievement Test–Spelling,* and the *Comprehensive Reading Assessment Battery* (i.e., words read aloud and correctly in 3 minutes on near- and far-transfer passages, and questions answered correctly).

Results. On most measures of phonological awareness, decoding, and word recognition, students in both PALS conditions (with and without repeated reading) performed statistically significantly better than control students. On fluency and comprehension measures, only students in PALS with repeated reading outperformed controls. These differential effects were observed among children in high-poverty and middle-class schools. They also held for students with disabilities as well as their low-, average-, and high-achieving classmates. The effect sizes on the fluency and comprehension measures approximated one third of a standard deviation. Although modest, they are statistically reliable. Furthermore, comparable effects were demonstrated across separate studies conducted in consecutive years. On the basis of these studies, we concluded that PALS is a feasible means of incorporating repeated reading into a classwide routine. We also concluded that PALS with repeated reading can be used productively with first-grade children to enhance fluency and comprehension outcomes—outcomes rarely addressed with such young children.

Comprehension

Lest readers think that all CASL research has been uniformly successful, we complete this description of CASL's reading research program at kindergarten and first grade by reporting on a different, ambitious, and *failed* attempt to increase first graders' comprehension skills (D. Fuchs & Fuchs, 2005). In keeping with CASL's overall theme of addressing higher order content with younger students, we assessed the value of teaching cognitive strategies to first graders to strengthen their comprehension of narrative texts. Research has documented the contribution of comprehension instruction for students in the intermediate grades (e.g., Rosenshine & Meister, 1994; Slavin, 1994) and at second and third grade (e.g., D. Fuchs et al., 1997; Saenz et al., in press). Parallel study has rarely been undertaken at first grade, and specific methods to promote the development of reading comprehension had not, to our knowledge, been developed.

Listening Comprehension. Undaunted, we designed peer-mediated comprehension instruction suitable for inclusion in first-grade PALS. Our treatment began with teacher-directed listening comprehension activities that involved children watching engaging videos. These activities quickly gave way to others requiring children to listen and respond to stories read aloud by their teachers. We began with listening comprehension because it provided the children with relatively rich narratives that involved characters, settings, plots, and other story features. These, in turn, facilitated more challenging and interesting comprehension activities than would have been possible if the children were required to read. Over time, teachers gradually modified the way in which discussions of the books they read to their students were conducted. First, they asked questions of individual students; then they directed questions to pairs of students; and finally, pairs of students asked questions of each other. After several months of listening comprehension activities, teachers made a transition to reading comprehension.

Reading Comprehension Activities. Teachers used the same three comprehension activities across listening and reading comprehension phases. In the first activity, which involved activating prior knowledge and making predictions, the teacher (and eventually the PALS coach) pointed to a book cover and illustrations and asked questions about the pictures. The purpose of these questions was to activate children's thinking about the book's focus and to encourage them to listen with purpose.

The purpose of the second activity, Think Time, was to encourage children to think about the importance of what they were regarding (video), listening to (teacher reading), and eventually reading. Further, Think Time was meant to promote the notion that thinking should be "on-line" all the time, which allows children to be dynamically connected to new information. Children were taught that comprehension is not something we do only after we see a video or read a book. To help children understand the idea of thinking on-line, or thinking interactively with story text, we used the metaphor of "making a movie." As children listened or read, their job was to make a movie in their heads corresponding to what they were learning in the story. At least twice during story listening or reading, the teacher stopped the children and said, "think time." The teacher then asked four questions: (a) Who's the movie/story about now? (b) Where are they? (c) What's happening? (d) What might happen next?

In the third activity, Story Shrinking, the reader's task was to express the gist of, or summarize, the story. The summary had to include at least two story features, such as character and setting, character and plot, or setting and outcome. The coach's job was to monitor the reader's summary for conciseness and completeness. If the reader's summary included only one story feature, the coach prompted the reader for a more inclusive description. The coach was given a card that served as both prompt (with symbols representing story fea-

tures) and checklist to help monitor the reader's performance.

Results. To study the effects of this first-grade PALS comprehension treatment, we (D. Fuchs & Fuchs, 2005) conducted a field-based experiment in which we randomly assigned 30 teachers, within schools, to three conditions: control, PALS alone, or PALS with comprehension instruction. The design and measures paralleled those of the first-grade PALS fluency studies already described. Results from this study were partly consistent with results from prior studies: PALS alone produced superior improvement on word-level reading skills, including word attack, word identification, and spelling. However, unexpectedly, PALS plus comprehension was associated with less strong word-level skill than PALS alone. Moreover, to our surprise and disappointment, there was no value added for the comprehension instruction on the comprehension outcome.

We speculated that the comprehension (Think Time) strategy inadvertently interrupted students' word- and text-reading practice, which may be more critical to first graders' reading development than comprehension strategies. Of course, study findings prove nothing but the null hypothesis. The possibility remains that comprehension strategy instruction at first grade, using better designed interventions or more sensitive measures of comprehension, may yet prove beneficial.

Conclusions: Recommendations for Practice and Future Research

For more than a decade, we have conducted randomized controlled studies, involving hundreds of teachers implementing treatments with naturally constituted classrooms, in scores of high-poverty and middle-class schools. During the past 5 years, working in kindergarten and first grade, we have demonstrated what we had previously shown in higher grades: the value of peer-mediated instruction to enhance students' reading outcomes in meaningful ways. Based on this program of research, and particularly our work as part of CASL, we draw five conclusions.

First and most fundamentally, we conclude that some instructional content reserved for older and more sophisticated learners can and should be directed to younger children. This content includes decoding and word recognition in kindergarten and fluency building in first grade. Second, PALS is a means of transforming knowledge about reading instruction, developed in highly controlled and artificial contexts, into routines and programs that real teachers in real schools can implement. Third, our treatment effects are generally positive and robust. In the series of studies described in this article, only an occasional measure revealed interactions between our treatments and student type (disabled, low, average, high) and school type (high poverty, middle class). Typically, where treatment effects emerged, they held for all student and school types.

Fourth, despite our treatments' general effectiveness and robustness, they did not help all individual children. There were always 10% to 20% who did not respond to even our most successful treatments. Although space limitations preclude discussion of the prevalence and characteristics of our nonresponsive students, the CASL research program systematically investigated these issues (see, e.g., Al Otaiba & Fuchs, in press; McMaster, Fuchs, Fuchs, & Compton, in press). Given the ubiquity of nonresponders in our work (and in the work of others; see Al Otaiba & Fuchs, 2002; Young & Fuchs, 2004), practitioners and researchers must recognize that no "validated practice," or "best practice," is universally effective. Good pedagogy—professional pedagogy—demands ongoing monitoring of student progress, irrespective of the instructional program, so that nonresponders can be identified promptly for more tailored attention.

Our last conclusion is this. Despite the demonstrable value of addressing higher order reading skills in the beginning grades, too much of a good thing—or, perhaps, the indiscriminant application of a generally productive principal—can have unintended consequences. As suggested by D. Fuchs and Fuchs (2005), the teaching of some higher order reading skills, including those that may appear developmentally appropriate, may be unproductive: First graders who received instruction in word-reading skill outperformed those participating in both word-reading and comprehension activities because, we believe, the activities designed to strengthen comprehension in advertently interrupted reading practice. Developing effective and robust instructional routines and programs require researchers to conduct rigorous, empirical, and sometimes iterative study. For the past 5 years, CASL researchers have tried hard to do this. Much work remains.

AUTHORS' NOTES

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REFERENCES

Adams, M. J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: MIT Press.

Al Otaiba, S., & Fuchs, D. (2002). Characteristics of children who are unresponsive to early literacy intervention: A review of the literature. *Remedial and Special Education, 23*(5), 300–316.

Al Otaiba, S., & Fuchs, D. (in press). Who are the young children for whom best practices in reading are ineffective? An experimental and longitudinal study. *Journal of Learning Disabilities*.

Baker, J. L., & Zigmond, N. (1990). Are regular education classes equipped

to accommodate students with learning disabilities? *Exceptional Children, 56,* 515–526.

Ball, E. W., & Blachman, B. A. (1991). Does phoneme segmentation training in kindergarten make a difference in early word recognition and developmental spelling? *Reading Research Quarterly, 26,* 49–66.

Braddock, J., II, Hawley, W., Hunt, T., Oakes, J., Slavin, R., & Wheelock, A. (1992). *Realizing our nation's diversity as an opportunity: Alternatives to sorting America's children.* Nashville, TN: Vanderbilt Institute for Public Policy Studies, Center for Education and Human Development Policy.

Bradley, A. (1998). Schools getting heat on reading. *Education Week, 17*(23), 1, 16–17.

Brennan, F., & Ireson, J. (1997). Training phonological awareness: A study to evaluate the effects of a program of metalinguistic games in kindergarten. *Reading and Writing: An Interdisciplinary Journal, 9,* 241–263.

Bryant, P., & Bradley, L. (1985). *Children's reading problems.* Oxford, England: Blackwell.

Byrne, B., & Fielding-Barnsley, R. F. (1993). Evaluation of a program to teach phonemic awareness to young children: A 1-year follow-up. *Journal of Educational Psychology, 85,* 104–111.

Carnine, D., Silbert, J., & Kameenui, E. J. (1990). *Direct instruction reading* (2nd ed.). Columbus, OH: Merrill.

Content, A., Kolinsky, R., Morais, J., & Bertelson, P. (1986). Phonetic segmentation in prereaders: Effect of corrective information. *Journal of Experimental Child Psychology, 42,* 49–72.

Cunningham, A. E. (1990). Explicit versus implicit instruction in phonemic awareness. *Journal of Experimental Child Psychology, 50,* 429–444.

Denton, C. A., Vaughn, S., & Fletcher, J. M. (2003). Bringing research-based practice in reading intervention to scale. *Learning Disabilities Research & Practice, 18,* 201–211.

Elkonin, D. B. (1973). USSR. In J. Downing (Ed.), *Comparative reading: Cross-national studies of behavior and processes in reading and writing* (pp. 551–579). New York: Macmillan.

Fox, B., & Routh, D. K. (1984). Phonemic analysis and synthesis as word attack skills: Revisited. *Journal of Educational Psychology, 76,* 1059–1064.

Fuchs, D., & Fuchs, L. S. (1994). Inclusive schools movement and the radicalization of special education reform. *Exceptional Children, 60,* 294–309.

Fuchs, D., & Fuchs, L. S. (1998). Researchers and teachers working together to adapt instruction for diverse learners. *Learning Disabilities Research and Practice, 13,* 126–137.

Fuchs, D., & Fuchs, L. S. (2005). Using peer mediation to strengthen reading comprehension in the elementary grades. In D. McNamara (Ed.), *Reading comprehension strategies: Theory, interventions, and technologies.* Unpublished manuscript.

Fuchs, D., Fuchs, L. S., & Burish, P. (2000). Peer-assisted learning strategies: An evidence-based practice to promote reading achievement. *Learning Disabilities Research and Practice, 15*(2), 85–91.

Fuchs, D., Fuchs, L. S., Mathes, P. G., & Simmons, D. C. (1997). Peer-assisted learning strategies: Making classrooms more responsive to diversity. *American Educational Research Journal, 34,* 174–206.

Fuchs, D., Fuchs, L., McMaster, K., Thompson, A., Yen, L., & Yang, N. (2005). *Peer-mediated approach to fluency building and reading comprehension.* Unpublished manuscript.

Fuchs, D., Fuchs, L. S., Thompson, A., Al Otaiba, S., Yen, L., & Braun, M. (2000). *Peer-assisted learning strategies for kindergarten: A teacher's manual.* Available from www.peerassistedlearningstrategies.net

Fuchs, D., Fuchs, L. S., Thompson, A., Al Otaiba, S., Yen, L., & Yang, N. J. (2000). *Peer-assisted learning strategies in reading: A teacher manual* (Rev. ed.). Available from Douglas Fuchs, Box 328 Peabody, Vanderbilt University, Nashville, TN 37203 (or http://www.peerassistedlearningstrategies.net)

Fuchs, D., Fuchs, L. S., Thompson, A., Al Otaiba, S., Yen, L., Yang, N. J., et al. (2001). Is reading important in reading-readiness programs? A randomized field trial with teachers as program implementers. *Journal of Educational Psychology, 93,* 251–267.

Fuchs, D., Fuchs, L. S., Thompson, A., Al Otaiba, S., Yen, L., Yang, N. J., et al. (2002). Exploring the importance of reading programs for kindergartners with disabilities in mainstream classrooms. *Exceptional Children, 68,* 295–311.

Fuchs, D., Fuchs, L., Thompson, A., Al Otaiba, S., Yen, L., & Yang, N. (2005). *Respective contributions of phonological awareness and decoding to reading development in Title I and non–Title I schools.* Unpublished manuscript.

Fuchs, L. S., & Fuchs, D. (2000). Building student capacity to work productively during peer-assisted reading activities. In B. Taylor, M. Graves, & P. van den Broek (Eds.), *Reading for meaning: Fostering comprehension in the middle grades* (pp. 95–115). New York: Teachers College Press.

Fuchs, L. S., & Fuchs, D. (2003). Can diagnostic reading assessment enhance general educators' instructional differentiation and student learning? In B. R. Foorman (Ed.), *Preventing and remediating reading difficulties: Bringing science to scale* (pp. 325–351). Timonium, MD: York Press.

Fuchs, L. S., Fuchs, D., Phillips, N. B., & Simmons, D. (1993). Contextual variables affecting instructional adaptation. *School Psychology Review, 22,* 725–742.

Fuchs, L. S., Fuchs, D., Prentice, K., Burch, M., Hamlett, C. L., Owen, R., et al. (2003). Explicitly teaching for transfer: Effects on third-grade students' mathematical problem solving. *Journal of Educational Psychology, 95,* 293–304.

Gersten, R., Vaughn, S., Deshler, D., & Schiller, E. (1995). *What we know (and still don't know) about utilizing research findings to improve practice: Implications for special education.* Unpublished manuscript.

Graham, S., & Harris, K.R. (1997). Self-regulation and writing: Where do we go from here? *Contemporary Educational Psychology, 22,* 102–114.

Greenwood, C. R., Delquadri, J. C., & Hall, R. V. (1989). Longitudinal effects of classwide peer tutoring. *Journal of Educational Psychology, 81,* 371–383.

Hatcher, P. J., Hulme, C., & Ellis, A. W. (1994). Ameliorating early reading failure by integrating the teaching of reading and phonological skills: The phonological linkage hypothesis. *Child Development, 65,* 41–57.

Hodgkinson, H. L. (1995, October). What should we call people? Race, class, and the census for 2000. *Phi Delta Kappan, 77,* 173–179.

Juel, C. (1988). Learning to read and write: A longitudinal study of 54 children from first through fourth grades. *Journal of Educational Psychology, 80,* 437–447.

Juel, C. (1996). What makes literacy tutoring effective? *Reading Research Quarterly, 31,* 268–289.

Juel, C., Griffith, P. L., & Gough, P. B. (1986). Acquisition of literacy: A longitudinal study of children in first and second grade. *Journal of Educational Psychology, 78,* 243–255.

Kantrowitz, B., & Underwood, A. (1999, November). Dyslexia and the new science of reading. *Newsweek, 133*(21), 72–77.

Lundberg, I., Frost, J., & Petersen, O. (1988). Effects of an extensive program for stimulating phonological awareness in preschool children. *Reading Research Quarterly, 23,* 263–284.

Lundberg, I., Olofsson, A., & Wall, S. (1980). Reading and spelling skills in the first school years predicted from phonemic awareness skills in kindergarten. *Scandinavian Journal of Psychology, 21,* 159–173.

Mathes, P., Howard, J., Allen, S., & Fuchs, D. (1998). Peer-assisted learning strategies for first grade readers: Making early reading instruction more responsive to the needs of diverse learners. *Reading Research Quarterly, 33,* 62–95.

McIntosh, R., Vaughn, S., Schumm, J. S., Haager, D., & Lee, O. (1993). Observations of students with learning disabilities in general education classrooms. *Exceptional Children, 60,* 249–261.

McMaster, K. L., Fuchs, D., Fuchs, L. S., & Compton, D. L. (in press). Responding to non-responders: An experimental field trial of identification and intervention methods. *Exceptional Children.*

O'Connor, R. E., Jenkins, J. R., & Slocum, T. A. (1995). Transfer among phonological tasks in kindergarten: Essential instructional content. *Journal of Educational Psychology, 87,* 202–217.

O'Connor, R. E., Notari-Syverson, N., & Vadasy, P. (1996). Ladders to literacy: The effects of teacher-led phonological activities for kindergarten children with and without disabilities. *Exceptional Children, 63,* 117–130.

O'Connor, R. E., Notari-Syverson, N., & Vadasy, P. (1998a). First grade effects of teacher-led phonological activities in kindergarten for children with mild disabilities: A follow-up study. *Learning Disabilities Research and Practice, 13,* 43–52.

O'Connor, R. E., Notari-Syverson, N., & Vadasy, P. (1998b). *Ladders to literacy: A kindergarten activity book.* Baltimore: Brookes.

Olofsson, A., & Lundberg, I. (1983). Can phonemic awareness be trained in kindergarten? *Scandinavian Journal of Psychology, 24,* 35–44.

Rosenshine, B., & Meister, C. (1994). Reciprocal teaching: A review of research. *Review of Educational Research, 64,* 479–530.

Rosner, J. (1974). Auditory analysis training with prereaders. *The Reading Teacher, 27,* 379–385.

Saenz, L., Fuchs, L. S., & Fuchs, D. (in press). Peer-Assisted Learning Strategies for English language learners with learning disabilities. *Exceptional Children.*

Schneider, W., Kuspert, P., Roth, E., & Vise, M. (1997). Short- and long-term effects of training phonological awareness in kindergarten: Evidence from two German studies. *Journal of Experimental Child Psychology, 66,* 311–340.

Slavin, R. E. (1994). *Cooperative learning: Theory, research, and practice* (2nd ed.). Boston: Allyn & Bacon.

Snow, C. E., Burns, M. S., & Griffin, P. (Eds.). (1998). *Preventing reading difficulties in young children.* Washington, DC: National Academy Press.

Stanovich, K. E., Cunningham, A., & Cramer, B. (1984). Assessing phonological awareness in kindergarten children: Issues of task comparability. *Journal of Experimental Child Psychology, 38,* 175–190.

Stevens, R. J., Madden, N. A., Slavin, R. E., & Farnish, A. M. (1987). Cooperative integrated reading and composition: Two field experiments. *Reading Research Quarterly, 22,* 433–454.

Torgesen, J. K., Wagner, R. K., & Rashotte, C. A. (1997). Prevention and remediation of severe reading disabilities: Keeping the end in mind. *Scientific Studies of Reading, 1,* 217–234.

Torneus, M. (1984). Phonological awareness and reading: A chicken and egg problem? *Journal of Educational Psychology, 76,* 1346–1358.

Vellutino, F. R., & Scanlon, D. M. (1987). Phonological coding, phonological awareness, and reading ability: Evidence from a longitudinal and experimental study. *Merrill-Palmer Quarterly, 33,* 321–363.

Wallach, M. A., & Wallach, L. (1976). *Teaching all children to read.* Chicago: University of Chicago Press.

Weiner, S. (1994). Effects of phonemic awareness training on low- and middle-achieving first graders' phonemic awareness and reading ability. *Journal of Reading Behavior, 26,* 277–300.

Wilder, A. A., & Williams, J. P. (2001). Students with severe learning disabilities can learn and transfer higher-order comprehension skills. *Journal of Educational Psychology, 93,* 268–278.

Williams, J. P. (1980). Teaching decoding with an emphasis on phoneme analysis and phoneme blending. *Journal of Educational Psychology, 72,* 1–15.

Yang, N. J., & Fuchs, D. (2004). *A meta-analytic review of the effects of repeated reading with remedial readers and students with disabilities.* Unpublished manuscript.

Young, C. L., & Fuchs, D. (2004). *On the irrelevance of intelligence in predicting responsiveness to reading instruction.* Unpublished manuscript.