
RESEARCH ON PEER-ASSISTED LEARNING STRATEGIES: THE PROMISE AND LIMITATIONS OF PEER-MEDIATED INSTRUCTION

Kristen L. McMaster

University of Minnesota, Minneapolis, Minnesota, USA

Douglas Fuchs
Lynn S. Fuchs

Peabody College of Vanderbilt University, Nashville, Tennessee, USA

This paper reviews research evaluating the effectiveness of Peer-Assisted Learning Strategies (PALS) for reading. Nearly fifteen years of research has demonstrated the effectiveness of this classwide peer tutoring program in improving the reading performance of high-, average-, and low-performing students, including students with disabilities, from kindergarten through high school. PALS activities and procedures for grades two through six, high school, kindergarten, and first grade are reviewed, as well as research indicating its effectiveness and feasibility for classroom implementation. Research exploring student unresponsiveness to PALS is also reviewed. The implications and recommendations for practice are discussed.

The 1997 amendments to the Individuals with Disabilities Education Act (IDEA) (U.S. Department of Education, 1997) stipulated that all students with disabilities should have access to the general education curriculum. Since then, policymakers have placed an increasing emphasis on the need for all students, including those with disabilities,

For more information about PALS research, training workshops, and access to materials, visit the PALS website at <http://www.peerassistedlearningstrategies.net>.

Address correspondence to Kristen L. McMaster, University of Minnesota, 233 Burton Hall, 178 Pillsbury, Dr. SE, Minneapolis, MN 55455. E-mail: mcmas004@umn.edu

to meet rigorous standards of knowledge and skill, and for teachers to be held accountable for academic outcomes of students with and without disabilities (Yell & Shriner, 1997). For example, the Reading First Initiative of the No Child Left Behind Act of 2001 (U.S. Department of Education, 2002) emphasizes that all children should be able to read well by third grade. More recently, the President's Commission on Excellence in Special Education (2002) released a report proposing to do away with the current "wait to fail" model of special education, embracing instead a model of prevention and early intervention. The report emphasizes the need to implement evidence-based instruction that has been demonstrated to meet the needs of diverse groups of students in general education classrooms and treat students with disabilities first and foremost as a part of the general education system.

Few would dispute the importance of early intervention or of implementing evidence-based instruction that promises to benefit many students. However, many teachers continue to feel unequipped to accommodate the diverse instructional needs of students with and without disabilities in their classrooms (Mastropieri & Scruggs, 1997; Vaughn et al., 2000). This is not necessarily due to the unavailability of effective interventions; indeed, a substantial research base documents the effectiveness of instructional strategies addressing a variety of academic areas, including reading (e.g., Ball & Blachman, 1991; Blachman et al., 1994; Byrne & Fielding-Barnsley, 1991; Fuchs et al., 2001a; Torgesen et al., 1997), math (e.g., Engelmann & Carnine, 1982; Marsh & Cooke, 1996; Peterson et al., 1988; Slavin et al., 1984), writing (e.g., Graham et al., 1991; Vaughn et al., 2000), and the content areas (e.g., Good & Brophy, 1994; Pearson & Johnson, 1978). The problem, perhaps, lies more in the inaccessibility of these strategies. That is, teachers have insufficient opportunity for training and on-site assistance to become proficient in using them, and many are not easy to implement, especially with large groups of students with a wide range of academic needs (e.g., Fuchs & Fuchs, 1998; Marston et al., 2003; Vaughn & Schumm, 1995; Vaughn et al., 2000).

Moreover, among the scientifically validated, academic interventions, relatively few instructional approaches have been determined successful for students with disabilities in the context of general education classroom implementation. Such research is not easy to implement because it must be conducted on a large scale, requiring substantial resources and school support. Moreover, the logistics of randomized field trials can be unwieldy and are often seen as unethical by schools and districts that strive to ensure equal student access

to promising interventions. Thus, only a handful of instructional approaches have been demonstrated—through rigorous experimental research—to have positive academic outcomes for students with a broad range of instructional needs and show promise as effective for use in general classrooms. One such approach, Peer-Assisted Learning Strategies for Reading (PALS), is the focus of this article.

Nearly fifteen years of pilot studies, component analyses, and large-scale experiments conducted in classrooms have demonstrated that PALS improves the reading achievement of low-, average-, and high-achieving students, including students with disabilities (e.g., Fuchs et al., 1997; Fuchs et al., 2001a; Simmons et al., 1994). Of particular importance to PALS research has been the close involvement of classroom teachers in its development and implementation (e.g., Fuchs & Fuchs, 1998; Fuchs et al., 2000; Fuchs et al., 2001a). Teachers' collaboration with PALS researchers has led to a set of programs that are not only effective for many students but are also efficient and feasible for classroom use. Because of this, PALS has earned "Best Practice" status from the U. S. Department of Education Program Effectiveness Panel, and many schools and districts have adopted PALS as part of their reading curricula. Of course, PALS is not without limitations. PALS researchers are currently identifying the kinds of students for whom PALS is not beneficial and finding ways to increase its effectiveness for them. In addition, researchers are continuing to examine how to maximize the accessibility of PALS to teachers who struggle to find ways to implement evidence-based instruction amid all of the other challenges they face.

The purpose of this article is to provide an overview of PALS and the research base that addresses its effectiveness in improving the reading performance of many students with and without disabilities in general education. First, the original PALS program that was developed for readers in grades two through six and the evidence of its effectiveness are discussed. Second, the research that has extended PALS upward to high school and downward to kindergarten and first grade is examined. Third, the limitations of PALS are identified. Finally, the implications for practice and recommendations for PALS implementation in general education classrooms, as well as ways to acquire PALS materials, are highlighted.

PALS FOR GRADES TWO THROUGH SIX

The PALS program in reading was originally developed by Douglas and Lynn Fuchs and their colleagues at Vanderbilt University for students in grades two through six (see Fuchs et al., 1997). PALS was

modeled after the classwide peer tutoring program (CWPT) developed by Delquadri and his associates (e.g., Delquadri et al., 1986) at the Juniper Gardens Children's Project at the University of Kansas. CWPT pairs all students in a classroom to work simultaneously on academic tasks. It was intended to "increase the proportion of instructional time that all students engage in academic behaviors and to provide pacing, feedback, immediate error correction, high mastery levels, and content coverage" (Greenwood et al., 1989, p. 372). Researchers have demonstrated that students participating in CWPT classrooms outperform students in control classrooms in reading, spelling, and math (e.g., Fantuzzo et al., 1992; Greenwood et al., 1989) and at both the elementary (e.g., Greenwood et al., 1989; Maheady & Harper, 1987) and secondary (Maheady et al., 1988) levels. The Vanderbilt group (e.g., Fuchs et al., 1997) was interested in extending this research by conducting large-scale studies (across multiple schools and classrooms) to evaluate the effects of PALS on low-performing students with and without disabilities and average-performing students. They were also interested in exploring how PALS fit into the context of teachers' reading instruction (Fuchs et al., 1997). In this section, the PALS program in grades two through six is described and the research findings are summarized.

PALS Features

PALS in grades two through six involves pairing high-performing and low-performing readers to conduct a series of activities to promote reading fluency and comprehension. PALS incorporates several important features. First, all students in a class are paired. Second, students are trained to use specific prompts, corrections, and feedback. Third, PALS incorporates frequent verbal interactions between tutors and tutees, increasing students' opportunities to respond (Delquadri et al., 1986; Greenwood et al., 1989). Fourth, roles are reciprocal, so that both students in a pair serve as tutor and tutee during each session. Fifth, PALS consists of a set of structured activities, and students are trained to implement them independently. These activities include Partner Reading with Retell, Paragraph Shrinking, and Prediction Relay. Teachers use a set of brief scripted lessons to train all students. The training lessons for each activity last thirty to sixty minutes per session and take two to three sessions to implement. These lessons include scripted teacher presentations, student practice, and teacher feedback. Following training, students in grades two through six participate in PALS three times each week, 35 minutes per session.

As indicated, every student in the class is paired with another student, and each pair consists of a higher- and a lower-performing student. The teacher determines the pairs by first rank-ordering all the students from the strongest to the weakest reader. The teacher then divides the rank-ordered list in half, pairs the strongest reader from the top half with the strongest reader from the bottom half, and so on until all students are paired. Although the tutoring roles are reciprocal during each tutoring session, the higher-performing student always reads aloud first to serve as a model for the lower-performing student.

Each pair is assigned to one of two teams for which they earn points during PALS. These points are awarded for correct responses during the activities. Each pair marks their points by slashing through numbers on a score card. Teachers also circulate among the pairs during PALS to monitor performance and award bonus points for cooperative behavior and for following the PALS procedures. At the end of each week, the pairs report the number of points they earned for their teams, and the teacher adds them up to determine the winning team. The teacher creates new pairs and teams every four weeks.

PALS Activities

PALS consists of a set of structured activities that students are trained to implement independently in the classroom. During each PALS session, the first activity is Partner Reading with Retell. Each student reads aloud from connected text for five minutes each. This text comes from the literature selected by the teacher and should be at an appropriate level for the lower-performing student in each pair. The higher-performer reads first, then the lower-performer reads the same text. Whenever the reader makes an error, the tutor says, "Stop, you missed that word. Can you figure it out?" If the reader does not figure out the word in four seconds, the tutor says, "That word is __. What word?" The reader says the word and continues reading. After both students have read, the lower-performing student retells the sequence of events just read for two minutes. Students earn one point for each sentence read correctly, and ten points for the retell.

The second PALS activity is Paragraph Shrinking. This activity is designed to develop comprehension through summarization and main idea identification. Students use a questioning strategy to direct their attention to the important ideas or events they are reading about (e.g., Jenkins et al., 1987). During Paragraph Shrinking, the students continue reading orally, but they stop at the end of each paragraph to

identify the main idea. The tutor asks the reader to identify who or what the paragraph is mainly about, and the most important thing about the “who” or “what.” The reader must condense, or “shrink,” this information into ten words or fewer. If the tutor determines that the reader’s answer is incorrect, she says, “That’s not quite right. Skim the paragraph and try again.” After the reader provides a new answer, the tutor decides whether the answer is correct. If so, she gives one point each for correctly identifying the “who” or “what,” stating the most important thing, and using ten words or fewer to state the main idea. If the tutor determines that the answer is incorrect, she provides a correct answer, and the pair continues reading. After five minutes, the partners switch roles.

The last activity, Prediction Relay, requires students to make predictions and then confirm or disconfirm them. This activity is included in PALS because making predictions is a strategy associated with improvements in reading comprehension (Palincsar & Brown, 1984). Prediction Relay consists of four steps: the reader makes a prediction about what will happen on the next half page to be read, reads the half page aloud, confirms or disconfirms the prediction, and summarizes the main idea. If the tutor disagrees with the prediction, she says, “I don’t agree. Think of a better prediction.” Students earn points for each reasonable prediction, for reading each half page, for accurately confirming or disconfirming the prediction, and for identifying the main idea in ten words or fewer. Again, the students switch roles after five minutes.

Research Findings

Researchers have reported positive academic and social outcomes of PALS. In a large-scale, experimental field trial (Fuchs et al., 1997), twelve schools in an urban and two suburban districts were stratified by student achievement and socioeconomic status and selected randomly to either implement PALS or to serve as no-treatment controls. PALS was implemented for fifteen weeks in twenty classrooms as part of the reading curriculum, while twenty classrooms continued with their regular reading programs. At the beginning of the study, the PALS and control classrooms did not differ significantly in terms of demographics, teacher experience, or student reading achievement. After fifteen weeks, however, students in PALS classrooms significantly outperformed their control counterparts in terms of growth on the Comprehensive Reading Assessment Battery (CRAB; Fuchs et al., 1989), a measure of reading fluency and comprehension. These effects held true for average and

low-achievers, including students with learning disabilities who had been mainstreamed in general education classrooms. In another study (Fuchs et al., 2002a), results indicated that students with learning disabilities in PALS classes enjoyed greater social acceptance than those with learning disabilities in non-PALS classes, suggesting that PALS has social, as well as academic, benefits.

UPWARD AND DOWNWARD EXTENSIONS OF PALS

In light of the effectiveness of PALS for grades two through six, and because reading problems typically begin early and persist well beyond the elementary school years, PALS researchers extended PALS to other grade levels, first upward to high school (Fuchs et al., 1999), then downward to kindergarten and first grade (Fuchs et al., 2001b). These programs retain many of the basic features included in the original PALS programs, such as reciprocal tutoring roles, structured activities, and frequent opportunities to respond and receive feedback. The newer programs were altered in other ways, however, to accommodate the specific needs of students at upper and lower grade levels.

High School PALS

High School PALS is similar to PALS for grades two through six, in that students work reciprocally in pairs, earn points for their teams, and work on the same three activities (Partner Reading, Paragraph Shrinking, and Prediction Relay). However, High School PALS differs from PALS for grades two through six in three ways. First, students switch partners every day instead of every four weeks. This accommodates the more frequent absences of high school students, which makes partner consistency difficult. High school students also seem to prefer interacting with different classmates. Second, the motivational system is based on a “work” theme. Pairs earn PALS dollars, which they deposit into checking accounts. They maintain these accounts and write checks to order items from a PALS catalog, such as CDs, fast-food coupons, and sports apparel that have been donated by local businesses. Third, High School PALS students typically read from expository, rather than narrative, text selected to address issues pertinent to their lives, such as work and social relationships.

High School PALS has been demonstrated to be a promising strategy to promote literacy among seriously reading-delayed adolescents (Fuchs et al., 1999). High school students who have participated in

PALS have significantly improved their reading comprehension scores in comparison to similar students in non-PALS programs. In addition, PALS students have reported working harder with their peers and working harder to improve their reading.

Kindergarten and First Grade PALS

Much of the reading research over the past two decades has emphasized the serious consequences of reading failure, and points to the difficulty in remediating deficits in reading beyond the early grades (e.g., Juel, 1988). Thus, the most recently developed PALS activities have focused on beginning reading skills critical for early literacy acquisition (Fuchs et al., 2001b). Specifically, Kindergarten PALS (K-PALS) and First Grade PALS activities address phonological awareness, beginning decoding, and word recognition, all skills that researchers have demonstrated to be important for successful beginning reading programs (e.g., Adams, 1990; Ball & Blachman, 1991; Blachman et al., 1994; Blachman et al., 1999; Byrne & Fielding-Barnsley, 1991; Hatcher, Hulme, & Ellis, 1994; O'Connor et al., 1996; Torgesen et al., 1997; Vellutino et al., 1996).

In this section, the features and activities of these two programs are described. Next, the research findings—first for K-PALS, and then for First Grade PALS—are summarized.

K-PALS Activities

As in the original PALS program, K-PALS students work in pairs. Teachers use a Rapid Letter Naming test, a good predictor of future reading performance (e.g., Torgesen et al., 1997) to rank-order students in the class. The highest-scoring student is paired with the lowest-scoring student, the second-highest scoring student is paired with the second-lowest student, and so on. Pairs change every four weeks.

Teachers prepare their children for PALS by modeling the activities in a whole-class format. The teacher acts as the “Coach” and the students are the “Readers” during eight introductory lessons. Gradually, individual students take turns assuming the role of Coach for the whole class. Then, the students tutor each other, alternating as Coach and Reader. The higher-performing student is always the Coach first. The teacher circulates among the student pairs, monitoring their progress and providing corrective feedback. K-PALS is conducted three times per week, twenty minutes per session.

Two types of activities are incorporated into PALS: Sound Play and Sounds and Words. Sound Play includes five phonological

awareness “games” that address rhyming, isolating first sounds, isolating ending sounds, blending sounds into words, and segmenting words into sounds. Each lesson sheet shows pictures of common animals and objects. Children are trained to use a standard coaching format for each type of lesson. For example, as illustrated in Fig. 1, the “First Sound” game shows rows of four pictures (e.g., seal, turtle, kite, saw). Two of the pictures begin with the same sound. In this lesson, the Coach would point to the first picture and say, “Seal, /sss/.” Then she would point to the other three pictures and say, “Which one starts with /sss/, turtle, kite, or saw?” The Reader should reply, “Saw, /sss/.”

Sounds and Words is made up of four activities. All activities are printed on one side of a lesson sheet (see Fig. 2). After the Reader has completed an activity one time, the Coach marks one of four happy faces printed at the end of the activity. The students then switch jobs and complete the activity again. The first activity, called “What Sound?,” displays rows of letters that the students read from left to right. A new letter sound is introduced in every other lesson. This new letter is in a box along with a picture of an animal or object that starts with that sound. The new letter sound is introduced by the

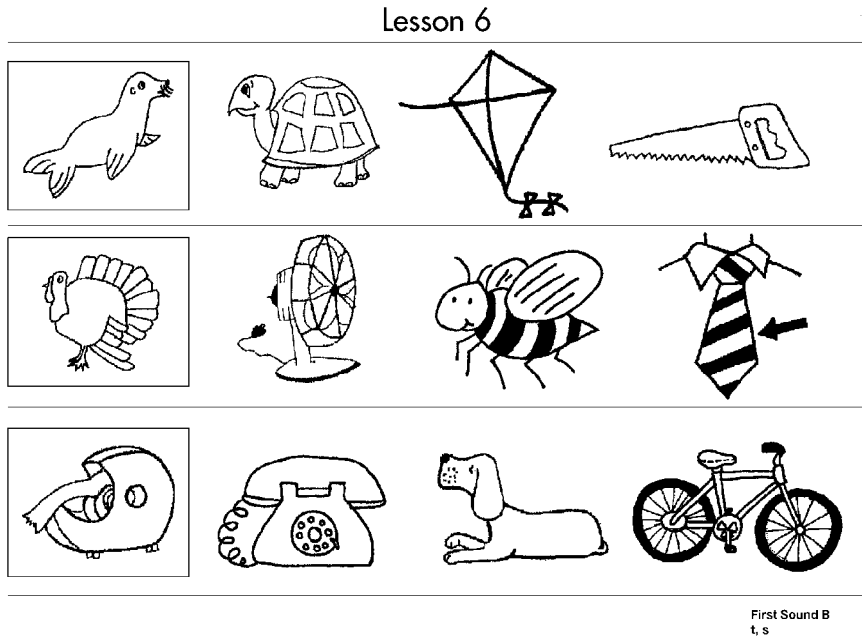


Figure 1. Sample Sound Play lesson sheet for Kindergarten PALS.

Lesson 34















<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 2px; text-align: center;">j </div> <div>d</div> <div>u</div> <div>j</div> <div>o</div> <div>i</div> <div>★</div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div>o</div> <div>j</div> <div>a</div> <div>u</div> <div>b</div> <div>★</div> <div>f</div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div>u</div> <div>b</div> <div>j</div> <div>s</div> <div>★</div> <div>i</div> <div>j</div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div>a</div> <div>j</div> <div>i</div> <div>u</div> <div>g</div> <div>f</div> <div>★</div> </div> <div style="text-align: center; margin-top: 10px;">     </div>	What sound?
<div style="display: flex; justify-content: space-around; align-items: center; margin-bottom: 10px;"> <div>l</div> <div>and</div> <div>on</div> <div>the</div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-bottom: 10px;"> <div>is</div> <div>l</div> <div>was</div> <div>and</div> </div> <div style="text-align: center;">     </div>	What word?
<div style="display: flex; justify-content: space-around; align-items: center; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px; text-align: center;">p i g</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">b i g</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">f a t</div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-bottom: 10px;"> <div style="border: 1px solid black; padding: 2px; text-align: center;">s a t</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">f i t</div> <div style="border: 1px solid black; padding: 2px; text-align: center;">s i t</div> </div> <p style="text-align: center; font-size: 1.2em; margin-bottom: 10px;">The fat pig sat.</p> <div style="text-align: center;">     </div>	 <p style="margin-top: 5px;">Sing it and read it.</p>

Figure 2. Sample Sounds and Words lesson sheet for Kindergarten PALS.

teacher. Then the Coach points to each letter and asks, “What sound?” The Reader says each sound. Stars are interspersed among the letters to prompt the Coach to praise the Reader (e.g., “Great job!”). When the Reader makes an error, the Coach says, “Stop, that sound is __. What sound?” The Reader says the sound, and the Coach says, “Start the line again.”

The second activity, “What Word?,” displays common sight words in rows on the lesson sheet. A new sight word is introduced in every other lesson, and the words build cumulatively across lessons. The teacher introduces the new sight word to the class at the beginning of the lesson. The Coach points to each sight word and asks, “What

word?” The reader reads the words, and the Coach corrects errors, just as in the “What Sound?” activity.

The third activity is called “Sound Boxes.” Students read decodable words comprised of letter sounds practiced in earlier lessons. The words in each lesson are presented in word families, such as “at,” “mat,” and “sat.” Again, words build cumulatively across the lessons. Each letter of a word is in a “sound box.” The Coach says, “Read it slowly,” and the Reader sounds out the word, pointing to each box. Then the Coach says, “Sing it and read it.” This prompts the Reader to blend the sounds together, and then read the word. The Coach corrects errors and praises the Reader for appropriate responses.

Finally, the students read sentences comprised of sight words and decodable words practiced in earlier lessons. The Coach says, “Read the sentences,” and provides corrective feedback for any errors as the Reader reads. At the end of the lesson, the students count up the happy faces they have marked, and record this number on point sheets.

Research Findings for K-PALS

Results of large-scale experimental research show that K-PALS can have a substantial positive impact on the beginning reading skills of many children, and that the K-PALS decoding activities provide an added value over phonological awareness training alone. Fuchs et al. (2001a) reported a study in which 33 classrooms were assigned randomly to three groups: control, phonological awareness training, and phonological awareness training with the K-PALS decoding activities. After approximately twenty weeks of intervention, the phonological awareness group and the phonological awareness with K-PALS group statistically significantly outperformed controls on measures of phonological awareness. Moreover, the K-PALS group statistically significantly outperformed the other two groups on measures of beginning reading skill. Fuchs et al. (2001a) also showed K-PALS to be effective in schools with a large percentage of minority children and children living in poverty, as well as in schools with predominantly white, middle-class student populations. Furthermore, Fuchs et al. (2002b) demonstrated that as a group, kindergartners with disabilities who participated in K-PALS outperformed kindergartners with disabilities in control classrooms. However, a number of kindergartners with disabilities who have participated in K-PALS have not improved their reading skills, a point to which we will return.

First Grade PALS Activities

The First Grade PALS program was developed based on the work of Mathes et al. (1998). As in K-PALS, the First Grade activities

emphasize beginning decoding skills and word recognition. In addition, First Grade PALS includes a fluency component, designed to include the speed and accuracy with which students read. For the first two weeks, teachers train students to follow PALS rules and work cooperatively to complete the PALS activities. Following training, PALS is conducted three times per week, 35–40 minutes per session.

Teachers use the Rapid Letter Naming test to rank order their students. The rank-ordered list is divided in half, and the strongest reader from the top half is paired with the strongest reader from the bottom half, and so on, until all students are paired. The higher-performing student in each pair is the Coach first, and the lower-performing student is the Reader first. New partners are assigned every four weeks.

Each PALS lesson begins with a brief teacher-led introduction. The teacher introduces new letter sounds and sight words, and then leads the students in segmenting and blending words that they will later decode in the lesson. The teacher says a word, and the students say the sounds in the word, holding up a finger for each sound. The teacher then shows them the word, and they blend the sounds together and read the word.

First Grade PALS activities are comprised of two main parts: Sounds and Words and Partner Reading. Sounds and Words is made up of four activities (see Fig. 3). The first activity, “Saying Sounds,” is similar to the “What Sound?” activity in K-PALS. The Coach points to each letter on the lesson sheet and says, “What sound?,” and the Reader says each sound. The Coach praises the Reader and provides corrective feedback. When the Reader has said all of the sounds, the Coach marks a happy face and five points on a point sheet. The students then switch roles.

The second activity is a blending task using the words the teacher presented at the beginning of the lesson. An arrow is printed under each word and small dots are printed under each phoneme. The Coach points to the first word and says, “Sound it out.” The Reader points to each dot and says the sounds. Then the Coach says, “Read it fast.” The Reader slides her finger along the arrow and reads the word fast. If the Reader makes an error, the Coach models sounding out the word and reading it fast; the Reader repeats the word and starts the line over. Again, the Coach marks a happy face and points, and the students switch roles.

The third activity is called “Read the Words.” Common sight words are presented in rows on the lesson sheet. The Coach says, “Read the words,” and the Reader points to each word and reads them. In the fluency version of PALS, many of the sight words are





Lesson 23		coach says:
n c h o ★ g n c		"What sound?"
o n d ★ i t p f c		
c n s n r h n ★		
	 5 points  5 points	
Pam • • •	Sid • • •	1. "Sound it out."
hat • • •	fast • • • •	2. "Read it fast."
grass • • • • •	cat • • •	
pan • • •	in • •	
	 5 points  5 points	

Figure 3. Sample Sounds and Words lesson sheet for First Grade PALS.

grouped into phrases. This prompts the Reader to read words as chunks rather than in isolation. Also, for the first half of the fluency version, students read the sight words in a “Speed Game” format. During the Speed Game, the teacher times the Readers for one minute as they read the sight words. The Readers then have two chances to try to read more words in one minute than they did the first time. Then the Coaches play the Speed Game. When students beat their times, they mark a star on a “Star Chart” which, when completed, can be exchanged for small prizes, such as bookmarks or pencils.

Next, students read short stories composed of the sight words and decodable words they have already practiced. Before the students











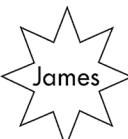


<p>23</p> <p>are has to come find see no are for</p> <p>he said are away with he has no was</p> <p>come find have blue have a and he</p> <p>are blue he has are for was away are</p> <p style="text-align: center;">   5 points 5 points </p>	<p>coach says:</p> <p>"Read the words"</p>
<div style="display: flex; justify-content: space-around; align-items: center;">  <div style="text-align: center;"> <p>Pam and James</p> </div>  </div> <p>Pam has a brother James.</p> <p>Pam has a baseball.</p> <p>Pam throws the baseball to James.</p> <p>Pam and James are in the grass at the park.</p> <p style="text-align: center;">       5 points 5 points 5 points 5 points 5 points 5 points </p>	<p>"Read the story."</p> <div style="text-align: center; margin: 10px 0;">  <p>James</p> </div> <div style="text-align: center; margin: 10px 0;">  <p>brother</p> </div>
<div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <p>Go back to "Read the words."</p> </div> </div>	

Figure 3. Continued.

read the story, the teacher introduces “rocket words” that have been added to make the stories more interesting. The teacher reads the story, providing a fluent model, and the Readers then read the story. If the Reader makes a mistake, or hesitates on a word for three seconds, the Coach says the correct word, and the Reader repeats it and continues reading. Happy faces and points are marked, and the students switch roles. In the fluency version, the Speed Game format is used with the story for the second half of the program. In the regular version, students mark stars on Star Charts when they have earned at least four happy faces for reading the story. The Star Charts are exchanged for prizes when completed.

After First Grade PALS has been conducted for 4–6 weeks, Partner Reading is introduced. This activity is conducted for ten minutes in each PALS session, immediately following the Sounds and Words activities. During Partner Reading, students use the decoding and word recognition skills that they have practiced during PALS to read books. Teachers select books that are appropriate to the reading level of the lower-performing student in each pair. The Coach reads the title of the book, pointing to the words, and then the Reader reads the title. The Coach then reads a page, pointing to the words, and the Reader repeats the same page. When the partners finish the book, they mark five points, switch roles, and read the book again. Each book is read four times before the pair receives a new book to read.

Research Findings for First Grade PALS

A major focus of PALS research at the first-grade level has been the exploration of the importance of including fluency-building skills in a beginning reading program. This is in light of increasing concern that reading fluency does not develop naturally in all students (see National Reading Panel, 2000) and is critical for reading comprehension (e.g., LaBerge & Samuels, 1974; Schreiber, 1987; Stanovich, 1980). Fuchs et al. (2001b) reported preliminary results of a study in which 33 first-grade classrooms were assigned randomly to one of three groups: First Grade PALS without fluency activities, First Grade PALS with fluency activities, and control. After approximately twenty weeks of intervention, students in both PALS groups statistically significantly outperformed controls on phonological awareness and alphabetic measures. Only the students who participated in the PALS fluency activities outperformed controls on measures of fluency and comprehension. As in previous PALS research, the benefits of First Grade PALS appear not to be mediated by student learner type (low-, average-, or high-performing), disability, or type of school (Title I vs. non-Title I).

PALS LIMITATIONS

Whereas PALS appears to benefit many students, including students with disabilities, some children do not make adequate achievement gains despite participating in the program. An estimated 20% of low-achieving nondisabled students (Mathes et al., 1998) and more than 50% of students with disabilities (Fuchs et al., 2002b) have not responded to PALS, as measured by growth on tests of phonological awareness, decoding, and word recognition. Al Otaiba & Fuchs (2002) attempted to identify characteristics of children predictive of their

responsiveness to PALS. They found nonresponders to have relatively weak phonological awareness, attention and behavioral control, and cognitive development, or to be students in high-poverty Title I schools.

In an attempt to address such unresponsiveness, McMaster, Fuchs, Fuchs, and Compton (2005) explored ways to identify and provide further intervention to students unresponsive to PALS. The primary purpose of the study was to determine the level of service delivery that was most beneficial to students whose reading difficulties were difficult to remediate. To do this, McMaster et al. compared the effects of PALS, a modified version of PALS, and one-to-one pull-out tutoring provided by an adult on the reading achievement of students who were not responding to PALS.

McMaster et al. (2005) first identified students “at-risk” for unresponsiveness to First Grade PALS based on teacher judgment and poor letter naming performance in the fall of first grade. These students’ progress was then monitored during seven weeks of PALS implementation using weekly word-level, curriculum-based measures and compared to the progress of average-performing PALS participants. Next, students were identified as unresponsive based on performance levels and growth rates significantly below those of average-performing peers. These nonresponders represented about 16% of the total PALS participants. Finally, the nonresponders were assigned randomly to either continue with the PALS intervention, receive a modified version of PALS, or receive one-to-one tutoring from a trained adult outside of the regular classroom. After seven additional weeks of these interventions, the rate of student unresponsiveness was reduced to 9%. However, neither the modified version of PALS nor the tutoring treatment proved to be more beneficial than the regular PALS treatment. This suggests that PALS is not beneficial for all students, and that we do not yet know all of the components that need to be in place for all students to respond to early reading intervention.

IMPLICATIONS FOR PRACTICE AND RECOMMENDATIONS FOR PALS IMPLEMENTATION

Teachers and researchers have worked hard to develop PALS into an effective program that is practical for classroom use (e.g., Fuchs & Fuchs, 1998; Fuchs et al., 2000; Fuchs et al., 2001b). A particular strength of this research is that classroom teachers, rather than research staff, implemented the PALS programs with their students. Results of the large-scale studies reviewed in this article demonstrate

that PALS can be used with success by teachers. A key to this success is that teachers have implemented the program with fidelity; that is, that they have conducted the activities accurately according to the procedures established during PALS development. We should note several features that were in place that likely contributed to teachers' fidelity of PALS implementation. First, teachers collaborating in PALS research participated in day-long training workshops. This training provided teachers with the opportunity to see demonstrations of PALS, practice the activities with guidance and support, and ask questions before implementing the program in their classrooms. Although PALS can be conducted using information from the PALS manuals, it is recommended that teachers who wish to use the program participate in a training workshop.

Second, teachers were provided with on-site technical support from research staff who made weekly classroom visits to observe, answer questions, and trouble-shoot problems that arose. Such support is not typically available to classroom teachers. Teachers using PALS may wish to periodically videotape the activities or have a peer trained in PALS observe their implementation to determine whether they are following the procedures. Third, PALS must be implemented at least three times per week for fifteen to twenty weeks (and four times per week in K-PALS classrooms in Title I schools). Whereas this may represent a significant time commitment, teachers have reported that PALS is practical, efficient, and fits well with their existing instructional programs (Fuchs et al., 2000), and many have implemented PALS during regularly-scheduled independent reading time (Fuchs et al., 1997).

Finally, and perhaps most importantly, teachers should know that PALS will not necessarily benefit all students. As with any instructional approach, it is critical to frequently monitor students' progress to determine whether they are making sufficient progress in reading. Ongoing progress measures such as Curriculum-Based Measurement (e.g., Deno, 1985) are very useful for this, as are other informal measures that teachers typically use in their classrooms. When progress monitoring results indicate that a student is not making progress, the teacher should consider modifying the activities or attempting alternative instructional strategies that address the student's individual needs.

SUMMARY

PALS has shown great promise as an effective supplement to conventional teaching methods to promote critical reading skills

and accommodate the increasingly diverse student population and academic diversity in today's classrooms. Peer tutoring makes use of one of the greatest resources in our schools, the students themselves. When empirically validated peer tutoring programs are implemented carefully and accurately, teachers can help many of their students make great strides toward literacy and success in school.

REFERENCES

- Adams, M. J. (1990). *Beginning to read: Thinking and learning about print*. Cambridge, MA: The 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*, 300–315.
- Ball, E. W. & Blachman, B. A. (1991). Does phoneme awareness training in kindergarten make a difference in early word recognition and developmental spelling? *Reading Research Quarterly, 26*, 49–66.
- Blachman, B. A., Ball, E., Black, R., & Tangel, D. (1994). Kindergarten teachers develop phoneme awareness in low-income, inner-city classrooms: Does it make a difference? *Reading and Writing: An Interdisciplinary Journal, 6*, 1–17.
- Blachman, B. A., Tangel, D. M., Ball, E. W., Black, R., & McGraw, C. K. (1999). Developing phonological awareness and word recognition skills: A two-year intervention with low-income, inner-city children. *Reading and Writing: An Interdisciplinary Journal, 11*, 239–273.
- Byrne, B. & Fielding-Barnsley, R. (1991). Evaluation of a program to teach phonemic awareness to young children. *Journal of Educational Psychology, 85*, 104–111.
- Delquadri, J., Greenwood, C. R., Whorton, D., Carta, J. J., & Hall, R. V. (1986). Classwide peer tutoring. *Exceptional Children, 52*, 535–542.
- Deno, S. L. (1985). Curriculum-based measurement: The emerging alternative. *Exceptional Children, 52*, 219–232.
- Engelmann, S. & Carnine, D. (1982). *Corrective mathematics program*. Chicago: Science Research & Associates.
- Fantuzzo, J. W., King, J. A., & Heller, L. R. (1992). Effects of reciprocal peer tutoring on mathematics and school adjustment: A component analysis. *Journal of Educational Psychology, 84*, 331–339.
- Fuchs, D. & Fuchs, L. S. (1998). Researchers and teachers working closely together to adapt instruction for diverse learners. *Learning Disability Research and Practice, 13*, 126–137.
- Fuchs, D., Fuchs, L. S., & Burish, P. (2000). Peer-Assisted Learning Strategies: An empirically-supported practice to promote reading achievement. *Learning Disabilities Research and Practice, 15*, 85–91.
- Fuchs, L. S., Fuchs, D., & Hamlett, C. L. (1989). Monitoring reading growth using student recalls: Effects of two teacher feedback systems. *Journal of Educational Research, 83*, 103–111.

- Fuchs, L. S., Fuchs, D., & Kazdan, S. (1999). Effects of Peer-Assisted Learning Strategies on high school students with serious reading problems. *Remedial and Special Education, 20*, 309–318.
- Fuchs, D., Fuchs, L. S., Mathes, P. G., & Martinez, E. (2002a). Preliminary evidence on the social standing of students with learning disabilities in PALS and No-PALS classrooms. *Learning Disabilities Research and Practice, 17*(4), 205–215.
- 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. S., Thompson, A., Al Otaiba, S., Yen, L., Yang, N., Braun, M., & O'Connor, R. (2001a). 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., Braun, M., & O'Connor, R. (2002b). Exploring the importance of reading programs for kindergartners with disabilities in mainstream classrooms. *Exceptional Children, 68*, 295–311.
- Fuchs, D., Fuchs, L. S., Thompson, A., Svenson, E., Yen, L., Al Otaiba, S., Yang, N., McMaster, K. N., Prentice, K., Kazdan, S., & Saenz, L. (2001b). Peer-assisted learning strategies in reading: Extensions for kindergarten, first grade, and high school. *Remedial and Special Education, 22*, 15–21.
- Good, T. L. & Brophy, J. E. (1994). *Looking in classrooms*. 6th ed. New York: HarperCollins College Publishers.
- Graham, S., Harris, K. R., MacArthur, C. A., & Schwartz, S. (1991). Writing and writing instruction for students with learning disabilities: Review of a research program. *Learning Disability Quarterly, 19*, 2–89.
- 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.
- Jenkins, J. R., Heliotis, J. D., Stein, M. L., & Haynes, M. C. (1987). Improving reading comprehension by using paragraph restatements. *Exceptional Children, 54*, 54–59.
- Juel, C. (1988). Learning to read and write: A longitudinal study of fifty-four children from first through fourth grade. *Journal of Educational Psychology, 80*, 437–447.
- LaBerge, D. & Samuels, S. J. (1974). Toward a theory of automatic information processing in reading. *Cognitive Psychology, 2*, 293–323.
- Maheady, L. & Harper, G. (1987). A classwide peer tutoring program to improve the spelling test performance of low-income, third- and fourth-grade students. *Education and Treatment of Children, 10*, 120–133.
- Maheady, L., Harper, G. F., & Sacca, M. K. (1988). Peer-mediated instruction: A promising approach to meeting the diverse needs of LD adolescents. *Learning Disability Quarterly, 11*, 108–113.

- Marsh, L. G. & Cooke, N. L. (1996). The effects of using manipulative in teaching math problem solving to students with learning disabilities. *Learning Disabilities Research and Practice, 11*, 58–65.
- Marston, D., Muyskens, P., Lau, M., & Canter, H. (2003). Problem Solving Model for decision-making with high-incidence disabilities: The Minneapolis experience. *Learning Disabilities Research and Practice, 18*(3), 187–200.
- Mastropieri, M. A. & Scruggs, T. E. (1997). Best practices in promoting reading comprehension in students with learning disabilities: 1976–1996. *Remedial and Special Education, 18*, 89–98.
- Mathes, P. M., Howard, J. K., Allen, S. H., & Fuchs, D. (1998). Peer-assisted learning strategies for first-grade readers: Responding to the needs of diversity. *Reading Research Quarterly, 31*, 268–289.
- McMaster, K. L., Fuchs, D., Fuchs, L. S., & Compton, D. L. (2005). Responding to nonresponders: An experimental field trial of identification and intervention methods. *Exceptional Children, 71*(14), 445–463.
- National Reading Panel. (2000). *Teaching students to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction*. Bethesda, MD: National Institutes of Health, National Institute of Child Health and Human Development.
- O'Connor, R. E., Notari-Syverson, A., & Vadasy, P. F. (1996). Ladders to literacy: The effects of teacher-led phonological activities for kindergarten children with and without disabilities. *Exceptional Children, 63*, 117–130.
- Palincsar, A. M. & Brown, A. L. (1984). Reciprocal teaching of comprehension-fostering and comprehension-monitoring activities. *Cognition and Instruction, 2*, 117–175.
- Pearson, P. D. & Johnson, D. D. (1978). *Teaching reading comprehension*. New York: Holt, Rinehart, & Winston.
- Peterson, S. K., Mercer, C. D., & O'Shea, L. (1988). Teaching learning disabled students place value using the concrete to abstract sequence. *Learning Disabilities Research, 4*, 52–56.
- President's Commission on Excellence in Special Education. A new era: Revitalizing special education for children and their families. July 1, 2002. Available at <http://www.ed.gov/inits/commissionsboards/whspecialeducation/index.html>. Accessed December 1, 2002.
- Schreiber, P. A. (1987). Prosody and structure in children's syntactic processing. In R. Horowitz & S. J. Samuels (Eds.), *Comprehending oral and written language* (pp. 243–270). New York: Academic Press.
- Simmons, D. C., Fuchs, D., Fuchs, L. S., Hodge, J. P., & Mathes, P. G. (1994). Importance of instructional complexity and role reciprocity to classwide peer tutoring. *Learning Disabilities Research and Practice, 9*, 203–212.
- Slavin, R. E., Madden, N. A., & Leavey, M. (1984). Effects of team assisted individualization on the mathematics achievement of academically handicapped and non-handicapped students. *Journal of Educational Psychology, 76*, 813–819.
- Stanovich, K. E. (1980). Toward an interactive-compensatory model of individual differences in the development of reading fluency. *Reading Research Quarterly, 16*, 32–71.

- 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.
- U.S. Department of Education. (1997). *Nineteenth annual report to Congress on the implementation of the Individuals with Disabilities Act*. Washington, D.C.: Author.
- U.S. Department of Education. (2002, February). *Reading first*. Available at: <http://www.ed.gov/offices/OESE/readingfirst/index.html>. Accessed March 13, 2002.
- Vaughn, S., Gersten, R., & Chard, D. J. (2000). The underlying message in LD intervention research: Findings from research syntheses. *Exceptional Children, 67*, 99–114.
- Vaughn, S. & Schumm, J. S. (1995). Responsible inclusion for students with learning disabilities. *Journal of Learning Disabilities, 28*, 264–270, 290.
- Vellutino, F. R., Scanlon, D. M., Sipay, E. R., Small, S., Chen, R., Pratt, A., Denckla, M. B. (1996). Cognitive profiles of difficult-to-remediate and readily remediated poor readers: Early intervention as a vehicle for distinguishing between cognitive and experiential deficits as basic causes of specific reading disability. *Journal of Educational Psychology, 88*, 601–638.
- Yell, M. L. & Shriner, J. G. (1997). The IDEA amendments of 1997: Implications for special and general education teachers, administrators, and teacher trainer. *Focus on Exceptional Children, 30*, 1–19.

Copyright of Reading & Writing Quarterly is the property of Routledge, Ltd.. The copyright in an individual article may be maintained by the author in certain cases. Content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.