

# Peer-Assisted Learning Strategies for English Language Learners With Learning Disabilities

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**ABSTRACT:** *This study assessed the effects of Peer-Assisted Learning Strategies (PALS), a reciprocal classwide peer-tutoring strategy, on the reading performance of native Spanish-speaking students with learning disabilities (LD) and their low-, average-, and high-achieving classroom peers. Participants were 132 native Spanish-speaking English language learners (ELL) in Grades 3 through 6, along with their 12 reading teachers. Teachers were assigned randomly to PALS and contrast groups. PALS sessions were conducted 3 times a week for 15 weeks. Students were tested before and after treatment. PALS students outgrew contrast students on reading comprehension, and those effects were not mediated by student type.*

**A**merican schools of the 21st century face the challenge of educating the world's most diverse student body (McLeod, 1994; Sprangenberg, Urbaschat & Pritchard, 1994). This diversity is reflected in variations in achievement, socioeconomic status, cultural background, and linguistic background (Fletcher, Bos, & Johnson, 1999; Pallas, Natriello, & McDill, 1989). With respect to differences in linguistic background, current estimates indicate that more than 2 million students come from non-English-speaking backgrounds (Fleischman & Hopstock, 1993) and that by the year 2020, this number will reach

6 million (Pallas et al., 1989). Although this group comprises students from many linguistic backgrounds, the largest subgroup is Spanish speakers. Specifically, in American schools, native Spanish speakers make up approximately 75% of English language learner (ELL) student population, and the numbers continue to increase (Special Issues Analysis Center, 1995, as cited in Baca & de Valenzuela, 1998).

For the field of learning disabilities, the increasing number of native-Spanish speakers has led to increasing concerns over the identification of appropriate assessment practices and effective instructional strategies for ELL. Nevertheless, minimal research has focused on examining effective

teaching strategies for ELL with learning disabilities (LD) when compared to the amount of research dedicated to issues related to the identification of appropriate assessment practices. Minimizing this gap in the literature is important given the low educational attainment of ELL and the increasing emphasis on selecting strategies that are scientifically based (ED., 2002). Peer-Assisted Learning Strategies (PALS; Fuchs, Fuchs, Mathes, & Simmons, 1997) is one strategy previously established as effective for native English-speaking students with LD in general education classrooms (Fuchs et al., 1997) that may also have potential for ELL with LD.

### PEER-ASSISTED LEARNING STRATEGIES

PALS is a reciprocal classwide peer-tutoring strategy with different grade level versions that extends the Juniper Gardens Children's project work on Classwide Peer Tutoring (Delquadri, Greenwood, Whorton, Carta, & Hall, 1986). The Grades 2-6 version of PALS includes three main activities: partner reading with retell, paragraph shrinking, and prediction relay. The purpose of the Grades 2-6 PALS activities is to increase strategic reading behavior, reading fluency, and comprehension. The strategies included in these activities are cumulatively reviewing information read, sequencing information, summarizing paragraphs and pages, stating main ideas in as few words as possible, and predicting and checking outcomes (Mathes, Fuchs, Fuchs, Henley, & Sanders, 1994). Kindergarten and Grade 1 versions of PALS have also been developed that address skills such as phonological awareness, letter-sound correspondence, and sight-word recognition (Fuchs, Fuchs, Al Otaiba et al., 2001; Mathes, Howard, Allen, & Fuchs, 1998). In this study, we examined the effects of the Grades 2-6 version of PALS on the reading performance of ELL with and without LD.

#### *PRIOR WORK ON PALS FOR NATIVE LANGUAGE SPEAKERS OF ENGLISH WITH LEARNING DISABILITIES*

The Grades 2-6 version of PALS has proven effective for increasing the reading performance of En-

glish proficient students with LD in general education classrooms (Fuchs et al., 1997; Simmons, Fuchs, Fuchs, Hodge, & Mathes, 1994; Simmons, Fuchs, Fuchs, Mathes, & Hodge, 1995). Gains for oral reading fluency have been educationally relevant with small to moderate effect sizes of .20 to .41 (Fuchs et al., 1997; Simmons et al., 1994, 1995). This finding is consonant with those in a related review of the literature conducted by Elbaum, Vaughn, Hughes, and Moody (1999) indicating that across different grouping formats (e.g., peer tutoring, cross-age tutoring,

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cooperative learning, small group work, etc.), results for oral reading fluency are generally not strong for students with high incidence disabilities in general education classrooms ( $ES = .27$ ). In contrast to gains for oral reading fluency, reading comprehension effects have been more robust ( $ES = .27$  to  $.68$ ; Fuchs et al., 1997; Simmons et al., 1994, 1995) especially when students with LD spend PALS time in both tutoring roles (i.e., tutor and tutee; Fuchs et al., 1997; Mathes & Fuchs, 1994). This differential effect for comprehension is not surprising, given that the majority of PALS time is allocated to comprehension.

PALS also appears to be a viable method for accommodating academic diversity of English proficient students in general education classrooms. Studies that established the effects of peer tutoring for English proficient students with LD also revealed strong, comparable effects for English proficient students identified as low achieving (Fuchs et al., 1997; Simmons et al., 1994, 1995) and average achieving students (Fuchs et al., 1997; Simmons et al., 1994) who participated in PALS alongside their peers with LD in general education classrooms. Students with high achievement in reading were not identified in these studies; therefore, it is unclear whether this group also benefits from PALS.

*WHY EXAMINE THE EFFICACY OF PALS  
FOR ENGLISH LANGUAGE LEARNERS WITH  
LD*

Five pedagogical reasons exist for examining the use of PALS with ELL. First, during PALS students spend time reading aloud from text or discussing text; therefore, PALS provides more frequent and extended opportunities to practice language than do traditional methods (Coelho, 1994; Long & Porter, 1985). Second, during PALS not only must students recall events from stories, but they must also summarize main ideas and make predictions as they read, thereby providing repeated occasions for producing the higher order language skills necessary for English language proficiency (Coelho; Long & Porter). Third, during PALS peer-tutoring pairs read from texts that are matched to students' reading ability; consequently, PALS allows for the individualization of instruction for students who may have different levels of English language proficiency. Fourth, because students are given corrective feedback by their peer tutor and are allowed to revise their answers when needed, PALS affords students the opportunity to talk themselves through a learning task without being inhibited by the need to be accurate in their response (Gersten, Baker, & Marks, 1998). Finally, PALS utilizes collaborative partners and teams as well as a motivational point system; therefore, PALS provides a positive affective climate and motivates students to become proficient in their English language skills (Long & Porter).

Pedagogical advantages of PALS for students with LD also exist. First, PALS increases time spent academically engaged (Delquadri et al., 1986). That is, rather than passive participation in reading (e.g., listening to the teacher read), PALS ensures active participation in reading (Simmons et al., 1995), an element typically lacking in instruction for students with LD (Limbrick, McNaughton, & Glynn, 1985). Second, because of the one-to-one nature of peer tutoring, PALS increases opportunities for responding (Delquadri et al.), receiving feedback (Greenwood, Carta, & Hall, 1988), and ongoing performance monitoring (Greenwood et al.).

Theoretical reasons also exist for examining the effectiveness of PALS for ELL with LD. For

example, students with LD are frequently described as passive readers who exhibit a limited set of reading behaviors (Wood & Algozzine, 1994). They are characterized as lacking specific skills in analyzing reading tasks, devising plans for reading, constructing meaning for reading, and overcoming obstacles encountered when reading (Wood & Algozzine). By contrast, students with strong reading skills are described as active learners who set a purpose for reading, give their complete attention to the reading task, monitor their reading comprehension, and use fix-up strategies when they do not understand (International Reading Association, 1988). Because PALS provides opportunities to practice reading strategies exhibited by strong readers, PALS should provide a method for improving strategic reading and the overall reading performance of students with LD.

With respect to second language theory, theorists assert that second language learning is contingent on having opportunities to receive comprehensible input, produce comprehensible output, and negotiate the meaning of utterances or text, which have not been comprehended (Krashen, 1980; Long & Porter, 1985; McGroarty, 1993; Swain, 1985). During whole-class lessons, teachers are able to provide an abundance of comprehensible input, but students have few opportunities to produce comprehensible output or negotiate meaning. PALS also provides opportunities for students to receive comprehensible

*Peer-Assisted Learning Strategies is one strategy previously established as effective for native English-speaking students with LD in general education classrooms.*

input, and, equally important, opportunities to produce comprehensible output and negotiate meaning (Coelho, 1994; Krashen; Long & Porter; Swain). PALS can also be linked to Cummins's (1980) theory of language proficiency, in which he postulates that language proficiency occurs in two levels: Basic Interpersonal Communication

Skills (BICS) and Cognitive Academic Language Proficiency (CALP). The two levels of language proficiency can be distinguished by the amount of contextual cues needed to benefit from communication. According to Cummins, it takes 2 years to master BICS and 5 to 7 years to acquire CALP. The implication of this language dichotomy for ELL is that until a student has acquired CALP, much of what occurs in the classroom will be too cognitively demanding if contextual cues are not provided (Garcia, 1999). That is, for learning to occur, ELL will need instruction that takes place in the presence of contextual cues. Peer-tutoring strategies like PALS have been recommended for providing effective contextual cues for teaching cognitively demanding tasks to students at the BICS level of language proficiency (Baca & de Valenzuela, 1998), PALS provides contextual cues for understanding cognitively demanding tasks because it occurs in face-to-face interactions, utilizes visual aids to prompt students through reading strategies, and ensures the use of text written at an appropriate instructional level.

#### **PURPOSE AND CONTRIBUTION OF THE PRESENT STUDY**

The present study examined the effects of PALS on the reading performance of elementary-age ELL with LD. It also examined the incidental benefits of PALS for low-, average-, and high-achieving ELL. Specific research questions addressed were: What are the effects of PALS on the reading performance of ELL with LD? Our prediction was that ELL with LD who participated in PALS would show greater reading improvement from pre- to posttreatment than their counterparts in a contrast condition. What are the incidental benefits of PALS to ELL with low, average, and high achievement in reading who participate in PALS? Our prediction was that ELL of varying achievement levels (i.e., low, average, and high) who participated in PALS alongside their peers with LD would show greater reading improvement from pre- to posttreatment than their counterparts in a contrast condition. To our knowledge, this is the first study of PALS conducted with ELL.

#### **METHOD**

##### *PARTICIPANTS*

*Teachers and Classrooms.* To be eligible to participate, each classroom had to have an all ELL student population. Additionally, each classroom had to have at least two students identified as LD. All students in each class participated in PALS. Participants were 12 general educators in third-through sixth-grade transitional bilingual education classrooms from one school district in South Texas. All participants taught reading only (math, social studies, and science were taught by a team teacher). Because of this teaching arrangement, each participating teacher taught two different reading classes for an equivalent amount of time daily. Thus, the amount of time devoted to reading instruction was controlled by the school schedule. Classrooms were stratified based on grade level and campus. Then, classrooms were randomly assigned to either the PALS condition or the contrast condition, resulting in PALS and contrast classrooms at each campus. Each participating teacher taught only one class included in the study. There were no statistically significant differences between teachers in the two treatment conditions on race, sex, age, certification in ELL or bilingual education, certification in special education, highest degree earned, hours of special education coursework, number of years teaching ELL students, number of years teaching special education students, and total number of years teaching (all  $p$ 's > .05). There was, however, a statistically significant difference between teachers in the number of hours of bilingual education or ELL coursework taken. The number of hours of bilingual education or ELL coursework taken was greater for teachers in the contrast group,  $U(10) = 6.00, p < .05, ES = .26$  (see Table 1).

*Students.* One hundred and thirty-two native Spanish-speaking students participated. All students were identified by their school district as ELL, as determined by Texas state eligibility criteria. These criteria include both lack of academic English language proficiency as measured by the minimum state standards competency exams and lack of fluent or advanced oral English language proficiency as measured by the *Woodcock Munoz Language Survey* (Woodcock & Munoz-Sandoval,

**TABLE 1***Teacher Demographic Data*

Variable	PALS (n = 6 classrooms)				Contrast (n = 6 classrooms)			
	M	SD	n	(%)	M	SD	n	(%)
Age								
30-39			3	(50)			5	(83)
40-49			2	(34)			0	(0)
50-59			1	(17)			1	(17)
Bilingual/ELL certification								
Bilingual			3	(50)			2	(33)
Bilingual+ELL			1	(33)			1	(17)
ELL			2	(17)			3	(50)
Special Ed certification								
Special Ed			0	(0)			0	(0)
Coursework hours								
Bilingual/ELL	9.00	(9.86)			29.67	(25.07)		
Special Ed	.00	(.00)			4.83	(8.26)		
Degree								
BS/BA			6	(100)			4	(67)
Med/MS			0	(0)			2	(33)
Sex								
Female			6	(100)			6	(100)
Race								
Caucasian			0	(0)			1	(17)
Hispanic			6	(100)			5	(83)
Teaching experience								
Bilingual	10.67	(5.85)			10.50	(8.17)		
Special Ed	.00	(.00)			.00	(.00)		
Total	12.17	(7.25)			11.83	(9.70)		

Note. PALS = Peer-Assisted Learning Strategies; ELL = English language learner.

1993). The mean and standard deviation for English scores for participating students on the *Woodcock Munoz Language Survey* (Woodcock & Munoz-Sandoval) were 3.11 and .71 (1 = negligible proficient, 2 = very limited proficient, 3 = limited proficient, 4 = fluent proficient, and 5 = advanced proficient).

Outcome data were collected on 11 students in each class: 2 students with LD (as determined by state and federal eligibility criteria), 3 low-achieving (LA) students, 3 average-achieving (AA) students, and 3 high-achieving (HA) students. To identify LA, AA, and HA students, teachers ranked students according to classroom observations, previous scores on minimum state standards competency exams, and district-re-

quired informal reading inventories. LA students were in the lowest quartile of the class rank; AA in the middle half; HA in the top quartile. At posttesting, 119 of the original 132 targets remained in the study: for the PALS condition, 10 LD, 15 LA, 17 AA, and 17 HA; for the contrast condition, 10 LD, 18 LA, 18 AA, and 14 HA. The attrition of 13 students was due to relocation to another school in the district or to the northern United States for seasonal employment.

There were no statistically significant differences between the two groups for the following variables: age, English language proficiency, grade, grade transitioned from Spanish reading language arts instruction to English reading language arts instruction, migrant student status, reading grade

**TABLE 2**

*Student Demographic Data by Treatment and Student Type*

Variable	Student Type	PALS (n = 59)				Contrast (n = 60)			
		M	SD	n	(%)	M	SD	n	(%)
Age in years	LD	10.90	(.88)			10.70	(1.25)		
	LA	10.20	(1.32)			10.61	(1.46)		
	AA	10.29	(1.05)			10.28	(1.18)		
	HA	10.25	(1.20)			10.21	(1.37)		
	ALL	10.36	(1.14)			10.43	(1.31)		
English language proficiency <sup>a</sup>	LD	2.51	(.80)			2.61	(.59)		
	LA	2.80	(.66)			3.23	(.53)		
	AA	3.12	(.64)			3.19	(.58)		
	HA	3.58	(.67)			3.49	(.68)		
	ALL	3.07	(.77)			3.17	(.64)		
Grade	LD	4.30	(1.16)			4.10	(1.20)		
	LA	4.13	(1.13)			4.33	(1.14)		
	AA	4.24	(1.09)			4.17	(1.10)		
	HA	4.24	(1.08)			4.36	(1.15)		
	ALL	4.22	(1.08)			4.25	(1.11)		
Grade transitioned	LD	2.30	(1.41)			1.10	(1.60)		
	LA	2.60	(1.55)			2.83	(1.72)		
	AA	2.65	(1.46)			2.50	(1.72)		
	HA	2.71	(1.31)			3.21	(1.63)		
	ALL	2.59	(1.40)			2.53	(1.78)		
Migrant students	LD			5	(17.25)			4	(21.10)
	LA			7	(24.10)			5	(26.30)
	AA			11	(37.90)			8	(42.10)
	HA			6	(20.70)			2	(10.50)
	ALL			29	(60.40)			19	(39.60)
Reading grade level	LD	2.20	(1.23)			2.31	(1.33)		
	LA	2.87	(1.36)			3.50	(.92)		
	AA	3.60	(.79)			3.84	(.78)		
	HA	3.90	(.75)			4.36	(1.01)		
	ALL	3.27	(1.19)			3.60	(1.16)		
Sex									
Male	LD			5	(15.20)			9	(26.50)

Table 2, (Continued)

Variable	Student Type	PALS (n = 59)				Contrast (n = 60)			
		M	SD	n	(%)	M	SD	n	(%)
	LA			10	(30.30)			8	(23.50)
	AA			10	(30.30)			10	(29.40)
	HA			8	(24.20)			7	(20.60)
	ALL			33	(49.30)			34	(50.70)
Sp Ed placement									
Resource				6	(60.00)			7	(70.00)
Content mast				4	(40.00)			3	(30.00)
Sp Ed years <sup>b</sup>		2.20	(.79)			2.44	(1.24)		
TAAS exempt <sup>c</sup>				5	(50.00)			8	(80.00)
TAAS scores <sup>e</sup>	LD	60.60	(19.89)			45.5	(17.68)		
	LA	70.47	(15.69)			69.24	(14.83)		
	AA	80.75	(14.46)			77.94	(16.28)		
	HA	87.00	(10.25)			85.36	(10.14)		
	ALL	77.94	(16.23)			75.76	(16.50)		
Years retained	LD	1.00	(.47)			.90	(.32)		
	LA	.73	(.88)			.44	(.51)		
	AA	.53	(.87)			.17	(.38)		
	HA	.24	(.44)			.13	(.00)		
	ALL	.58	(.75)			.33	(.48)		

Note. PALS = Peer-Assisted Learning Strategies. For both groups, LD = learning disabled; LA = low-achieving; AA = average achieving; HA = high achieving. For PALS, LD ( $n = 10$ ); LA ( $n = 15$ ); AA ( $n = 17$ ); HA ( $n = 17$ ). For contrast, LD ( $n = 10$ ); LA ( $n = 18$ ); AA ( $n = 18$ ); HA ( $n = 14$ ).

<sup>a</sup>English language proficiency measured by Woodcock-Munoz language proficiency test. 1 = negligible; 2 = very limited; 3 = limited; 4 = fluent; 5 = advanced. <sup>b</sup>LD students only. <sup>c</sup>Administered after Week 5 of PALS implementation.

level, sex, special education placement, number of years in special education, Texas Assessment of Academic Skills (TAAS) exemption, and TAAS scores in reading (all  $p$ 's > .05), with the exception of years retained  $F(1, 111) = 5.29$ ,  $MSe = .33$ ,  $p < .05$ . The number of years retained was greater for students in the PALS group,  $ES = .68$ . The number of students retained in both groups was, however, low (see Table 2).

#### PALS CONDITION

Training materials, classrooms materials, teacher and student training methods, and reading activities were identical to those used by Fuchs et al. (1997). PALS was conducted during regularly scheduled reading instruction three times a week

for 35 min each session. The duration of PALS implementation was 15 weeks (not including pre- and posttesting or training). Using the ranking procedure used to identify students as low-, average-, or high-achieving in reading, teachers paired students for PALS by splitting the ranked list in half (i.e., one list represented the weaker half of readers; the other list represented the stronger half). Students at the top of each list were paired. Next, students ranked second on each list were paired, etc. Pairs were rotated every 3 to 4 weeks. Within each pair, during each lesson, both students served in the role of tutor and tutee. During PALS, students engaged in the three reading activities described in the following.

*Partner Reading With Story Retell.* During Partner Reading, each student read aloud for 5 min. For the first 5 min of Partner Reading, the stronger reader read while the lower-performing reader served as the tutor. After 5 min, the weaker reader reread the same text while the stronger reader served as tutor. As a tutor, students were taught to listen for different kind of errors. Errors included: saying the wrong word, adding a word, leaving out a word, or taking longer than 4 s to read the word. When a student made one of these errors, the tutor responded by saying, "Stop. You missed that word. Can you figure it out?" If the tutee was able to read the word within 4 s, the tutor said, "Good. Read that sentence again." If the tutee could not figure out the word within 4 s, the coach said, "That word is \_\_\_\_\_. What word?" Then, the tutee repeated the word and the tutor said, "Good. Read that sentence again." If neither student knew the word, the tutor raised his or her hand to signal the teacher for help. During the Story Retell segment of Partner Reading, the weaker reader of the pair retold in sequence what was read in the previous 10 min. Tutors prompted their partner by using the phrases, "What happened first?" and "What happened next?" continuing this process for 2 min.

*Paragraph Shrinking.* During Paragraph Shrinking, each student read aloud for 5 min, stopping after each paragraph to summarize what was read. Students summarized by giving a main idea statement when prompted by the tutor using the following sequence. First, tutees named the *who* or *what* of the paragraph. Second, tutees named the *most important thing about the who or what*. Third, tutees stated the main idea in 10 words or less. If the tutee gave an inaccurate response, the tutor said, "That's not quite right. Skim the paragraph and try again." Then, the tutee skimmed the paragraph and tried to answer the missed question. As in Partner Reading, the stronger readers read for the first 5 min and the weaker reader read for the second 5 min with the student who was not reading serving as tutor. However, when the second reader read, he or she read new text.

*Prediction Relay.* During Prediction Relay, the reader made a prediction before reading, read half a page, checked the prediction, and summarized the half page using the Paragraph Shrinking

strategy. This cycle was repeated for every half page read. As in Paragraph Shrinking, each student read aloud for 5 min and had an opportunity to assume both roles. The order of reading remained the same as in the previous PALS activities.

*Teams and Points.* During PALS, students had an opportunity to earn points. The behaviors for which students could earn points were directly associated with the three PALS activities. During Partner Reading, students earned one point for each sentence read correctly. During Paragraph Shrinking, students earned points for making good main idea statements. For Prediction Relay, students earned points for making good predictions and good main idea statements.

In addition to forming pairs, PALS required that teachers form student teams. The purpose of forming teams was to motivate students to work hard and try their best during PALS. To form teams, the teacher distributed pairs into two groups. To ensure that the achievement level was evenly distributed between the two teams, the teacher used a procedure similar to that used for forming pairs. To illustrate, the top ranked pair was placed on team A and the second ranked pair was placed on team B. Then, the third ranked pair was placed on team A and the fourth ranked pair was placed on team B. This process was continued until all pairs had been assigned to a team.

*Materials.* For PALS, teachers selected materials of their choice. Some examples of materials that teachers selected were basal texts, novels, library books, and content area books. What was important, however, was that teachers selected books appropriate for the weaker reader of the pair. Thus, across a given classroom, pairs read from different books.

*Teacher Training.* Teachers assigned to the PALS condition were trained at a full-day workshop. At the workshop, teachers were first given an overview of PALS procedures. Then, they practiced the PALS activities to gain a better understanding of the intervention. The emphasis of the training, however, was on how teachers could train their students on PALS. At the end of the workshop, teachers were given a comprehensive and detailed PALS manual, which included scripted lessons to be used when conducting student training (Fuchs, Mathes, & Fuchs, 1997).



*Student Training.* Set-up procedures (e.g., student roles, student materials, rules), Partner Reading, and Paragraph Shrinking were taught by teachers in the PALS condition 1 week prior to the beginning of the 15 weeks of PALS implementation. This training required five 45-min training sessions. During Weeks 1 through 4, Partner Reading and Paragraph Shrinking were implemented. During Week 5, Prediction Relay was taught requiring two 45-min training sessions. Then, during Weeks 6 through 16, all three PALS activities were conducted. During the seven training sessions, teachers modeled key procedures and allowed students to role play. Project staff was present for each day of training to provide technical assistance to the classroom teacher as necessary. This assistance consisted of helping the teacher set up and organize materials prior to the training lessons, modeling peer-tutoring strategies with the teacher, and monitoring students to identify pairs that were having difficulty. No data was collected on the types of students who received the most attention and feedback during training or implementation. Upon completion of training, project staff visited each classroom for the duration of the implementation of PALS.

*Treatment Fidelity.* The treatment fidelity instrument, an observation checklist comprising 25 teacher behaviors and 115 student behaviors, was also taken from Fuchs et al. (1997). The student behaviors were divided among Partner Reading with Retell ( $n = 35$ ), Paragraph Shrinking ( $n = 41$ ), and Prediction Relay ( $n = 39$ ). The checklist items were scored as either having occurred, not occurred, or not applicable. Each observation yielded five scores: an overall teacher score, an overall student score, and separate student scores for each of the three reading activities. Treatment fidelity was assessed two times for each PALS classroom at Weeks 6 and 12. At Week 6, only the Partner Reading and Paragraph Shrinking PALS activities were evaluated. At Week 12, all three PALS activities, including Prediction Relay, were evaluated. Interobserver agreement for each observation was calculated as agreements/agreements + disagreements (see Sulzer-Azaroff & Mayer, 1977). For the overall teacher score at Times 1 and 2, the mean percentage of agreement was 100% and 99%. For the student scores, re-

spective figures were: overall scores, 98% and 99%; Partner Reading, 99% and 98%; Paragraph Shrinking, 96% and 99%; and Prediction Relay, only relevant at Time 2, 99%.

The teacher and student behaviors for each observation were evaluated by dividing the total number of observed behaviors by the total number of expected behaviors, yielding mean accuracy scores. For teachers, the mean accuracy at Times 1 and 2 was 94% and 93%. For students, the mean accuracy at Times 1 and 2 was 95% and 93%. For Partner Reading, the mean accuracy at Times 1 and 2 was 92% and 90%. For Paragraph Shrinking, the mean accuracy at Times 1 and 2 was 96% and 94%. For Prediction Relay, only relevant at Time 2, the mean accuracy was 96%.

#### CONTRAST CONDITION

Teachers in the contrast condition were asked to conduct reading instruction in their normal fashion. To evaluate the type of instruction provided in PALS and contrast classrooms, all participating teachers submitted their lesson plans for review during Weeks 6 and 12 of PALS implementation. The lesson plan sheets were evaluated for information regarding (a) percentage of activities per week spent in one-to-one, small-group, whole-class instruction, and independent seatwork; and (b) percentage of activities where instruction was delivered by the teacher or peers. To examine differences between treatment groups, 6 one-way ANOVAs were conducted with treatment as the between-subjects factor. Statistically significant differences were found between treatment conditions for the amount of one-to-one instruction provided  $F(1, 10) = 4.91$ ,  $MSe = 103.09$ ,  $p = .05$ ,  $ES = .33$ . Findings revealed 26% of the activities in the PALS classrooms were done via one-to-one instruction, compared to only 13% in the contrast classrooms. Significant differences were not found between the treatment groups for small-group instruction, whole-class instruction, and independent seatwork. Statistically significant differences were found between the two conditions for the comparisons of teacher-led activities,  $F(1, 10) = 8.03$ ,  $MSe = 99.52$ ,  $p = .01$ ,  $ES = .45$  and peer-mediated activities  $F(1, 10) = 8.03$ ,  $MSe = 99.52$ ,  $p = .01$ ,  $ES = .45$ . Teacher-led instruction was used for 78% of activities conducted in PALS classrooms and 94% of activities done in the con-

trast classrooms. Peer-mediated instruction was used for 22% of the activities conducted in PALS classrooms and for 6% of the activities done in contrast classrooms. However, because of the nature of PALS, the difference in the types of activities planned by PALS and contrast teachers might be expected. Percentage of intercoder agreement, calculated for each variable on all lesson plan sheets, ranged from 87% to 96%.

#### MEASURES

*Reading: The Comprehensive Reading Assessment Battery (CRAB).* The CRAB makes use of four 400-word traditional folktales, which were rewritten by Fuchs, Fuchs, and Hamlett (1989) to approximate a second- to third-grade readability level (Fry, 1968) while maintaining their meaning. The CRAB requires students to read aloud from one folktale for 3 min and then to answer 10 comprehension questions. On a second folktale, they (a) have 2 min to complete a cloze or maze; (b) read aloud for 3 min; and (c) answer 10 comprehension questions. The comprehension questions require short answers reflecting recall of information contained in idea units of high thematic importance. The maze activity was prepared by leaving the first sentence intact; thereafter, every seventh word was replaced with a 3-item multiple-choice format, where only one item provides a semantically correct replacement. The CRAB generates three scores: number of words read correctly, number of comprehension questions answered correctly, and maze choices correct. The words correct score was the number of words read correctly over two 3-min samples. The questions correct score was the number of questions answered correctly, averaged across two 10-question samples. The maze score was the number of correct replacements. We considered the words correct score as a measure of reading fluency; the questions correct score to be a measure of reading comprehension; and the maze score to reflect both fluency and comprehension.

Test-retest reliability for words correct ranges from .93 to .96 (Fuchs, Deno, & Marston, 1983) and concurrent validity with the reading comprehension subtest of the Stanford Achievement Test (SAT) is .91 (Fuchs, Fuchs, & Maxwell, 1988). For questions correct, construct validity with the reading comprehension subtest

of the SAT is .82 (Fuchs et al.). For maze choices correct, concurrent validity with the reading comprehension subtest of the SAT is .82 (Fuchs et al.).

The order of test administration and passages was counterbalanced across treatment conditions. Interscorer agreement for each type of score was assessed on 25% of the passages. Interscorer agreement for words correct, questions correct, and maze choices correct at pretreatment was 99%, 97%, and 98%, respectively. Interscorer agreement for words correct, questions correct, and maze choices correct at posttreatment was 99%, 98%, and 96%, respectively.

*Teacher and Student Questionnaires.* During the last week of PALS, teachers completed a two-part questionnaire used in previous PALS research (Fuchs et al., 1997). Using a 5-point Likert-type scale, teachers gave their opinions of the academic and social benefits of PALS for students with LD, and low-, average-, and high-achieving students. Students also completed a questionnaire previously used by Fuchs et al. (1997). Question items differed from those posed to evaluate teachers' satisfaction with PALS. Questions addressed issues related to students' enjoyment and their perceived social and academic benefits of participation in PALS.

## RESULTS

### CRAB

*Pretreatment Scores.* To evaluate the comparability of students in the two treatment conditions prior to the implementation of PALS, one between-subjects and one within-subjects ANOVA was conducted for each CRAB score, using teacher as the unit of analyses. The between-subjects factor was treatment (PALS vs. contrast condition); the within-subjects factor was student type (LD, LA, AA, and HA).

For words correct, the ANOVA indicated the main effect of treatment was not statistically significant; the main effect of student type was statistically significant,  $F(3,30) = 20.81$ ,  $MSe = 6,201.97$ ,  $p < .001$ ; and the treatment by student type interaction was not statistically significant. For questions correct, the main effect of treat-

**TABLE 3**

*CRAB Scores by Treatment and Student Type*

Student type/trial	Words Correct			Questions Correct			Maze Choices Correct					
	PALS (n = 6 teachers)	M	SD	Contrast (n = 6 teachers)	M	SD	PALS (n = 6 teachers)	M	SD	Contrast (n = 6 teachers)	M	SD
Learning disabled												
Pre	190.08	(52.07)	182.38	(124.65)	1.54	(0.83)	1.67	(1.34)	6.58	(3.18)	6.92	(4.53)
Post	218.83	(65.41)	177.83	(114.23)	2.71	(1.32)	1.50	(1.23)	7.58	(2.24)	6.33	(2.89)
Improvement	28.75	(20.16)	-4.54	(29.74)	1.67	(.70)	-0.17	(.68)	1.00	(1.45)	-0.59	(3.06)
Low achieving												
Pre	259.90	(76.22)	278.94	(58.04)	2.87	(1.25)	3.23	(1.76)	8.02	(2.81)	8.94	(3.90)
Post	278.97	(86.40)	296.94	(61.39)	4.05	(2.55)	3.14	(1.35)	9.17	(3.87)	10.05	(2.95)
Improvement	19.07	(51.51)	18.00	(19.02)	1.18	(1.98)	-0.10	(.86)	1.14	(2.42)	1.11	(1.94)
Average achieving												
Pre	309.75	(34.75)	309.95	(17.76)	3.89	(1.62)	4.28	(1.25)	9.93	(2.81)	8.71	(2.10)
Post	323.15	(43.99)	318.39	(30.69)	4.43	(1.50)	3.86	(.81)	11.05	(2.85)	10.00	(1.05)
Improvement	13.43	(17.97)	8.44	(24.28)	0.54	(1.34)	-0.42	(1.03)	1.12	(1.77)	1.28	(1.78)
High achieving												
Pre	342.29	(49.86)	371.33	(28.92)	5.43	(1.45)	5.89	(2.53)	11.44	(4.08)	12.28	(2.71)
Post	384.37	(62.25)	408.35	(99.31)	6.58	(1.43)	4.50	(1.06)	13.44	(3.19)	12.53	(4.14)
Improvement	42.08	(27.02)	37.02	(73.26)	1.15	(.60)	-1.39	(1.66)	2.00	(3.12)	.25	(3.00)

*Note.* CRAB = Comprehensive Reading Assessment Battery; PALS = Peer-Assisted Learning Strategies.

ment was not statistically significant; the main effect of student type was statistically significant,  $F(3,30) = 15.35$ ,  $MSe = 34.97$ ,  $p < .001$ ; and the treatment by student type interaction was not statistically significant. For maze choices correct, the main effect of treatment was not statistically significant, the main effect of student type was statistically significant,  $F(3,30) = 6.65$ ,  $MSe = 54.237$ ,  $p = .001$ ; and the treatment by student type interaction was not statistically significant (see Table 3).

*Pre- to Posttreatment Improvement Scores.* To evaluate the pre- to posttreatment improvement of students in the two treatment conditions, one between-subjects and one within-subjects ANOVA was conducted for each *CRAB* improvement score, using teacher as the unit of analyses. As with pretreatment scores, the between-subjects factor was treatment (PALS vs. contrast condition); the within-subjects factor was student type (LD, LA, AA, and HA). *ESs* were computed by calculating the difference between mean improvement scores divided by  $[sd/\sqrt{2(1-r_{xy})}]$  (Glass, McGaw, & Smith, 1981).

For words correct, main effect of treatment was not statistically significant; the main effect of student type was not statistically significant; and the treatment by student type interaction was not statistically significant. *ESs* for the treatment main effect for LD, LA, AA, and HA students, respectively, were 1.01, .04, .32, and .13. Across the student types, the *ES* was .60.

For number of questions correct, the main effect of treatment was statistically significant,  $F(1,10) = 12.91$ ,  $MSe = 27.99$ ,  $p < .001$ ; the main effect of student type was not statistically significant; and the treatment by student type interaction was not statistically significant. *ESs* for the treatment main effect for LD, LA, AA, and HA students, respectively, were 1.03, .86, .60, and 1.02. The *ES* across student types was 1.02.

For maze choices correct, the main effect of treatment was not statistically significant; the main effect of student type was not statistically significant; and the treatment by student type interaction was not statistically significant. Effect sizes for the treatment main effect for LD, LA, AA, and HA students, respectively, were .75, .02, .13, and .68. Across student types, the *ES* was .40 (see Table 3).

#### TEACHER AND STUDENT QUESTIONNAIRES

Teachers responded favorably when asked about the academic and social benefits of PALS for different student types. Teachers responses to the following questions ranged from 4.33 to 4.83 (1 = not at all, 5 = very): (a) PALS helped increase the overall reading achievement of students; (b) PALS helped improve the social skills of students; (c) Awarding points contributed to the reading achievement of students; (d) Working with a partner contributed to the reading achievement of students; and (e) PALS helped increase the reading self-confidence of students.

Results of the student questionnaire indicated that students enjoyed participating in PALS. Students' responses to the following questions ranged from 3.30 to 4.93 (1 = not at all, 3 = kind of, 5 = a whole lot): (a) How much do you think PALS helps you become a better reader? (b) How much do you like PALS? (c) How much do you like being a coach? (d) Did you like earning points? (e) Did PALS help you become better friends with other students?

#### DISCUSSION

This study investigated the effects of PALS on the reading performance of ELL with LD. It also examined incidental benefits of PALS for ELL with low, average, or high achievement in reading. The rationale for examining incidental benefits was to investigate whether PALS, as an approach to peer tutoring, benefits not only struggling readers, but also adequate and superior readers. The overall focus on ELL is important because of the historically low educational attainment of ELL and their increasing presence in our public school systems (ED, 2002).

For ELL with LD who participated in PALS, strong results on reading comprehension were obtained for pre- to posttreatment improvement: The *ES* favoring the PALS condition exceeded one standard deviation on *CRAB* questions answered correctly. With respect to incidental effects for low-, average- and high-achieving classmates, respectively, *ESs* were also strong: .86, .60, and 1.02. In these ways, results corroborated our predictions.

These findings are notable for three reasons. First, reading comprehension is considered to be the major developmental milestone at Grades 3 to 6 (Jacobs, 2002). Thus, support for PALS on this critical and often difficult-to-achieve component of reading is important, especially because the sizeable effects on this important outcome were achieved with strong teacher and student satisfaction. That is, teachers judged PALS to be easy to implement, and children enjoyed the PALS activities. Moreover, relative to Fuchs et al.'s (1997) findings, our comprehension results for ELL with LD were more robust: Whereas Fuchs et al. obtained an *ES* of .68 for English proficient PALS students with LD, our *ES* for ELL with LD exceeded 1 standard deviation. This pattern also held for nondisabled students: Fuchs et al.'s *ES*s were .40 and .10 for English proficient students with low and average achievement, respectively, whereas our *ES*s were considerably higher at .86 and .60.

Two additional reasons why these findings are important both concern validation of PALS with additional populations. Previously, no PALS study had examined effects for ELL, and prior PALS research at Grades 3-6 had not described effects for high achievers. Documenting effects for ELL, with and without LD, is critical in light of the ever-increasing population of Spanish speakers in our schools. Moreover, because of differences in student characteristics, strategies previously validated with English proficient students must also be empirically validated with ELL before widespread use is recommended. Separating effects for high achievers is also important because parents and school personnel sometimes express concern about high achievers spending instructional time helping other students with less strong reading skills. Our effects provide the basis for allaying these concerns: With an *ES* exceeding 1 standard deviation, PALS activities designed to increase reading comprehension, in fact, promoted high achievers' development. This occurred even though they were paired with lower achieving students to practice those strategic reading behaviors.

At the same time, despite strong differential gains favoring PALS across achievement categories on questions correct, effects for words correct, or maze choices correct failed to achieve

statistical significance. The lack of statistical significance on the reading fluency (words correct) measure and the maze task (a measure of fluency and comprehension) is disappointing. Nevertheless, for ELL with LD, the population for whom reading fluency remains a substantial challenge at third grade (Mastropieri, Leinart, & Scruggs, 1999), the *ES* was large (1.01 standard deviations). This *ES* is provocative, but given the sample size of 12 teachers, a Type II error is likely. Discarding an effective intervention to help ELL with LD, who are still struggling to achieve fluency as a developmental milestone, would be unfortunate, especially when effects on questions correct exceeded 1 standard deviation. Of course, averaged across all students, the *ES* fell to .60, suggesting that PALS effects on word-reading outcomes, including fluency, may be limited to ELL with LD. This pattern recurred on *CRAB* maze, where the *ES* for ELL with LD was large (.75 standard deviations), but where effects fell even farther when averaged across student types (.40 standard deviations). In any case, results provide the basis for future studies to examine effects on words correct with larger samples of ELL, with and without LD. This is especially the case in light of Fuchs et al.'s (1997) previous findings of statistical significance on *CRAB* fluency (words read correctly) with English proficient students.

The clearest conclusion to be drawn from study findings is that PALS improves the reading comprehension of ELL with and without LD in transitional bilingual education classrooms. When interpreting this finding, however, it is important for readers to note several study limitations. Two limitations pertain to external validity. First, research assistants provided technical assistance daily during student training and weekly after training. It is unclear whether teachers and students would have been as successful with PALS implementation had this support not been provided. Results comparable to those obtained in the present study may not occur in situations where technical assistance is not provided. Second, our classrooms were comprised of an entirely ELL student population, who spoke Spanish as a first language. This arrangement is not the setting in which most Spanish-speaking ELL are found. Spanish-speaking ELL may receive instruction in settings comprised of students who speak a num-

ber of different first languages. Alternatively, they may receive instruction in settings where they are the only, or one of few, ELL in the class. Whether the results obtained in the present study can be expected for Spanish-speaking ELL in those settings remains unknown.

A different limitation concerns internal validity. In the present study, PALS students had been retained more years than students in the contrast condition. On the one hand, it is possible that the additional time in school experienced by PALS students could provide some advantage. Of course, research on the effects of grade retention suggests otherwise, revealing retention to be a detrimental practice (McCoy & Reynolds,

*The clearest conclusion to be drawn from study findings is that PALS improves the reading comprehension of ELL with and without LD in transitional bilingual education classrooms.*

1999; Pierson & Connell, 1992; Walters & Borgers, 1995; Westbury, 1994). This lends greater credibility to the other possibility that students in the PALS group were at some initial disadvantage compared to contrast group peers. If so, then the test of PALS efficacy in this study was a conservative one, making the demonstration of PALS effects more impressive.

A final limitation, already mentioned, involves statistical power. Because teachers were randomly assigned to treatment conditions, teachers were used as the unit of analysis, resulting in a sample size of 6 per condition. This limits statistical power, making it difficult to detect significance. One manifestation of poor statistical power in this study is the finding of an *ES* of 1.03 for words read correctly for ELL with LD in contrast to smaller *ES*s of .04 to .32 for other student types—without a statistically significant treatment by student type interaction.

In light of study limitations, future research should be conducted to further test the efficacy of PALS at Grades 3 to 6 for improving the reading performance of ELL with and without LD. Fu-

ture research should be directed at determining whether results similar to those of the present study would be obtained if no technical assistance were provided. To do this, the effects of PALS with technical assistance and PALS without technical assistance would need to be compared. Also, data might be collected on the types of teachers and students who need the most assistance and what type of assistance is required.

In addition, because the present study examined effects for ELL who all spoke the same first language, additional work should examine the effects for heterogeneous language pairs. For example, future research could be done to determine whether Spanish-speaking ELL would make similar gains to those of the present study if they were paired with English proficient students or if they were paired with speakers of other first languages. This question seems important to regions of the country where ELL might be members of more diverse classrooms.

Finally, future research on the effects of PALS for ELL with LD should employ larger samples. Utilizing larger samples would increase the power to detect differential improvement between conditions or differential improvement for the different student types. A study with increased statistical power would be important not only for documenting PALS' effects on a greater variety of reading components, but also to provide insightful explanations for differential improvement if this was the case.

#### IMPLICATIONS FOR PRACTICE

One implication for practice of the present study is that PALS is an effective practice for promoting reading comprehension among ELL of varying achievement levels. Effects were statistically significant and educationally impressive. A likely explanation for the magnitude of the gains on comprehension experienced by ELL in the present study is that PALS is well suited to their learning needs. PALS is a strategy that is closely aligned with theories of second language learning and second language proficiency (Baca & de Valenzuela, 1998; Coelho, 1994; Long & Porter, 1985). To restate, PALS provides opportunities for ELL to receive comprehensive input, produce comprehensible output, and negotiate meaning (Coelho, 1994; Long & Porter, 1985). PALS also

provides contextual cues for teaching the cognitively demanding task of reading to ELL. For these reasons, PALS is a good match for ELL with and without LD.

A second implication for practice of the present study is that because of lack of attention to specific word reading skills, PALS may not be the optimal strategy to use to improve the oral reading fluency of ELL. For our measures of reading fluency (CRAB words correct as well as maze correct), statistical significance was not obtained, and although *ESs* of 1.03 and .70 were obtained for ELL with LD, treatment by student type interaction effects did not achieve statistical significance. Of course, the focus of Grade 2-6 PALS is not on how to attack unfamiliar or difficult-to-read words in text. For such a focus, teachers would need to rely on Grade 1 or the modified version of Grade 2 PALS, which incorporates an explicit focus on word-level skill development (e.g., Fuchs, Fuchs, Thompson et al., 2001; Fuchs, Fuchs, Yen et al., 2001).

Although readers need to consider study limitations carefully, results clearly indicate that at Grades 3 to 6, PALS improves the reading comprehension performance of ELL with and without LD in transitional bilingual education classrooms. PALS enhances students' reading development, even as students enjoy PALS and teachers find PALS easy to use.

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