Review of Educational Research
February 2017, Vol. 87, No. 1, pp. 103–133
DOI: 10.3102/0034654316653663

Academic Effects of Peer-Mediated Interventions With English Language Learners: A Research Synthesis

Daniel Pyle, Nicole Pyle, and Benjamin Lignugaris/Kraft
Utah State University

Lillian Duran
University of Oregon

Jessica Akers
University of Nebraska Medical Center

The purpose of this article is to synthesize the extant research on peer-mediated interventions (PMIs) with English language learners (ELLs) in kindergarten through Grade 12. Fourteen studies that were published in peer-reviewed journals from 1983 to 2013 were examined in terms of study characteristics, the effects on academic outcomes, study quality, and overall effectiveness. Structured, heterogeneous grouping was used in the 10 peer pairing and 4 collaborative/cooperative grouping PMIs with ELLs. Eight of the 14 studies included high methodological quality. Overall, PMIs with ELLs are associated with medium to large effects on measures of phonemic awareness, vocabulary, and comprehension when compared to teacher-mediated comparison conditions. More research on PMIs with ELLs in high school and across core content areas, particularly mathematics, is warranted. Implications and future research for PMIs with ELLs are discussed.

Keywords: English language learners, systematic review, peer-mediated interventions

English language learners (ELLs) are the fastest growing subgroup of students in the public education system in the United States (Genesee, Lindholm-Leary, Saunders, & Si Christian, 2005; Kindler, 2002). In 2012–2013, about 10% of public education students, or nearly 5 million students, participated in ELL programs compared to 8.7% of students, or about 4 million students in 2002–2003 (Kena et al., 2015). On the National Assessment of Educational Progress reading

measure, ELLs underperform in comparison to their non-ELL peers (Snyder & Dillow, 2009–2013). From 2002 to 2013, fourth-grade and eighth-grade non-ELLs averaged from 39 to 44 scale points higher than ELLs on the National Assessment of Educational Progress reading measure (U.S. Department of Education, 2002–2013). The persistent discrepancy between ELLs' and non-ELLs' reading performance exemplifies the increased academic challenges the majority of ELLs face (Francis, Rivera, Lesaux, Kieffer, & Rivera, 2006). Low academic achievement of ELLs has severe implications at the high school level as well. ELLs are less likely to pass their state's exit/graduation exam (Sullivan et al., 2005) and are more likely to drop out of school (Ruiz-de-Velasco, Fix, & Clewell, 2000) than their non-ELL peers.

As schools implement the Common Core State Standards (CCSS), it is critical that school leaders and teachers understand what evidence-based instructional approaches and interventions might be used to improve ELLs' college and career readiness skills (DiCerbo, Anstrom, Baker, & Rivera, 2014; National Governors Association [NGA] & Council of Chief State School Officers [CCSSO], 2010). Mastery of academic language skills is arguably the single most important key to academic success for ELLs (Francis et al., 2006). Proficiency in academic language affects ELLs' ability to comprehend and analyze texts, their ability to write and express themselves effectively, and their acquisition of academic content (Echevarria, Short, & Powers, 2006; Francis et al., 2006; Gersten et al., 2007). Skills such as these are included in the CCSS as students master the standards in reading, writing, speaking, listening, and language in each content area (NGA & CCSSO, 2010).

A limited but expanding body of empirically supported instructional approaches and interventions is available to help educators meet the needs of all ELLs, especially those with academic difficulties. The Institute of Education Sciences practice guides provide information on evidence-based literacy and English language instructional practices for ELLs in the elementary grades (Gersten et al., 2007) and for teaching academic content and literacy to ELLs in elementary and middle school (Baker et al., 2014). Gersten et al. (2007) provided five recommendations to improve ELLs' literacy: (a) screen for reading problems and monitor progress, (b) provide intensive small-group reading interventions, (c) provide extensive and varied vocabulary instruction, (d) develop academic English, and (e) schedule regular peer-assisted learning opportunities. Researchers suggest that teachers of ELLs should devote approximately 90 minutes a week to instructional activities in which pairs of students at different ability levels or different English language proficiencies work together in a structured fashion to practice and extend academic material that was taught previously (Gersten et al., 2007). Likewise, in a more recent practice guide, Baker et al. (2014) recommended small-group instruction with ELLs struggling in areas of literacy and English language development. In sum, small-group instruction and peer practice, often characterized as peer-mediated interventions (PMIs), are recommended practices for improving reading achievement (What Works Clearinghouse [WWC], 2007a, 2010b) and English language development of ELLs (WWC, 2007a, 2007b).

Many researchers use the term *PMIs* when referring to either peer pairing/peer tutoring or collaborative/cooperative grouping (Maheady, Harper, & Sacca,

1988; Wexler, Reed, Pyle, Mitchell, & Barton, 2015). In peer pairing, students work in partners (dyads) to tutor each other (Greenwood, Delquadri, & Hall, 1989). In collaborative and cooperative grouping, students work in small groups to accomplish goal-directed activities (Puzio & Colby, 2013). For the purpose of this review, PMI is defined as a structured intervention strategy in which peers work in dyads or small groups to practice an academic skill or learn academic content. Furthermore, the term *ELL* is used to include similar labels (e.g., limited English proficient [LEP], Spanish-speaking bilinguals [SSB]) reported by other authors.

PMIs provide ELLs with frequent opportunities to develop academic language and content area learning (Heron & Harris, 2001; Mercer & Mercer, 2001). Moreover, PMIs have the potential to effectively and rapidly increase English language development, particularly decontextualized language concepts with high degrees of cognitive challenge (Gersten & Baker, 2000). Heron, Welsch, and Goddard (2003) suggested that using students to support instruction is perhaps the most underused and valuable classroom resource. By using students to support instruction, teachers can provide individualized learning opportunities during the independent-practice phase of the instructional cycle (Greenwood, Carta, & Kamps, 1990; Hudson, Lignugaris/Kraft, & Miller, 1993). Although there is emerging evidence that supports the use of PMIs with ELLs, there is an extensive literature base that supports the use of PMIs for improving learning of students with disabilities in mathematics (Baker, Gersten, & Lee, 2002; L. S. Fuchs, Fuchs, & Karns, 2001; L. S. Fuchs, Fuchs, Yazdian, & Powell, 2002), reading (Allor, Fuchs, & Mathes, 2001; D. Fuchs, Fuchs, & Burish, 2000), science (Bowman-Perrott, Greenwood, & Tapia, 2007; Mastropieri et al., 2006), social studies (Mastropieri, Scruggs, Spencer, & Fontana, 2003; Scruggs, Mastropieri, & Marshak, 2012), and spelling (Greenwood et al., 1989; Harper, Mallette, Maheady, Parkes, & Moore, 1993).

One procedural hallmark of PMIs is matching students strategically. Two strategic approaches used to match students are heterogeneous grouping and homogeneous grouping. Heterogeneous groups include students of various ability levels, such as high performers matched with low performers (Lou et al., 1996). For example, in peer pairing interventions teachers may rank-order students in the class based on a specific variable (e.g., reading ability level) with the highest performing students in one column and the middle to lowest performing students in the next column. Students are then paired by rank order in the two columns, that is, the highest performing student with the middle-performing student, the second highest performing student with the second middle-performing student, and so on, until all students are paired (D. Fuchs, Fuchs, Mathes, & Simmons, 1997). Similarly, in cooperative learning, teachers may rank-order students in the class, divide the list into three to five columns, and select one student from each column to create a heterogeneous group. On the other hand, homogeneous groups include students who perform at similar levels (Slavin, 1987). For instance, Slavin and Karweit (1985) grouped students on the basis of an initial basic skills mathematics test in each class. Students were rank-ordered and divided into a high group and a low group. Teachers differentiated materials and moved through the curriculum at a faster pace with the high group as compared to the low group.

Previous Reviews

Three systematic reviews conducted previously highlight the effects of PMIs on students' outcomes. In a meta-analysis, Cole (2013) reviewed the effectiveness of peer-mediated instruction on ELLs' oral and written language outcomes. In the two other reviews, Lou et al. (1996) and Puzio and Colby (2013) highlighted the effectiveness of cooperative and collaborative learning interventions on non-ELLs' academic outcomes.

Cole (2013) reported that peer-mediated instruction is highly effective for improving ELLs' oral and written language. Cole suggested that peer-mediated instruction was more effective when the students' native language was used during instruction. In addition, ELLs performed better in general education classes where they had access to their native English-speaking peers and language support services. While Cole focused on oral and written language outcomes, the present review addresses all academic outcomes. Cole included international journals, dissertations, and technical reports, many of which were not peer-reviewed. In contrast, the present review includes only peer-reviewed studies conducted in U.S. schools. Finally, Cole included collaborative learning studies in which students were simply divided into groups and given a task. The students then established their own structure for accomplishing the task. In the present review, studies were excluded if they did not describe replicable tutoring or cooperative learning procedures. Notably, only 3 of the 32 studies that were presented in Cole's meta-analysis met the inclusion criteria for this systematic review (Almaguer, 2005; Calhoon, Al Otaiba, Greenberg, King, & Avalos, 2006; Prater & Bemudez, 1993).

Lou et al. (1996) examined the effects of PMIs on student achievement at the elementary, secondary, and postsecondary levels. First, the authors analyzed studies in which researchers compared a reciprocal peer tutoring format (i.e., students alternated between the roles of tutor and tutee) to students working individually. Overall, small effects were found favoring reciprocal peer tutoring compared to individual student work in Grades 1 to 12. In their second analysis, Lou et al. compared reciprocal peer tutoring with homogeneous groups, to reciprocal peer tutoring with heterogeneous groups. Small effects were reported in favor of homogenous groups. Importantly, the authors did not disaggregate outcome data to report the effects of PMI groupings on ELLs' achievement.

Puzio and Colby (2013), in a meta-analysis of 18 research studies, examined the effectiveness of cooperative and collaborative learning interventions on literacy outcomes. They reported that the cooperative and collaborative activity structures used in Cooperative Integrated Reading and Composition (Slavin, 1987) and other cooperative and collaborative programs improved student literacy achievement. Students who had access to cooperative and collaborative interventions had significantly higher literacy achievement scores than students who did not have access to cooperative and collaborative interventions. Similar to Lou et al. (1996), Puzio and Colby (2013) did not disaggregate outcome data to report the effects of cooperative or collaborative learning on ELLs' literacy outcomes.

Rationale and Research Questions

PMIs (peer pairing, cooperative or collaborative grouping) are often used to improve academic outcomes for students with and without disabilities. Despite the available research on PMIs, there is no systematic review that addresses the effectiveness of PMIs on the academic outcomes of ELLs. The purpose of this systematic review is to synthesize the available peer-reviewed literature to determine the effects of PMIs on the academic outcomes of ELLs in Grades K–12. The following research questions are addressed:

Research Question 1: What are the characteristics of PMIs with ELLs in Grades K–12?
Research Question 2: What are the effects of PMIs on improving academic outcomes of ELLs in Grades K–12?
Research Question 3: What is the methodological quality of the available PMI studies that address academic outcomes of ELLs in Grades K–12?

Method

Search Procedure and Corpus of Studies

A four-step search procedure was carried out that included (a) an electronic search, (b) an ancestral search of all articles included in this review, (c) an ancestral search of three recent reviews, and (d) a hand search of nine peer-reviewed journals. An electronic search was conducted of Academic Search Premier, ERIC, and PsycINFO to locate studies published between 1983 and 2013. This 30-year time frame encompasses research that adequately represents the current status of the field (see WWC, 2014). Terms and root words related to peer-mediated (*peer partner*, peer tutor*, peer mentor*, peer mediat*, peer support, peer pair*, peer interaction, peer learn*, peer-to-peer, peer instruct*, reciprocal teaching, reciprocal peer tutoring, peers as tutors, peer-assist*, tutor-tutee, collaborat*, cooperative, response group**) were used in combination with ELL-related terms and root words (*English as a second language* and *ESL, limited English proficient, LEP, English language learner, ELL, English learner, EL, culturally linguistically diverse, CLD, language minority, bilingual, structured English immersion, dual language learner, second language learner*) to locate relevant articles.

The initial electronic search yielded 4,914 articles. The abstracts were divided among four raters and studies were selected based on the following criteria:

1. Participants were identified as ELLs. To be inclusive of the most commonly used terms to describe ELLs, we included studies with participants identified as ESL and LEP. Studies were excluded that included ELLs but did not disaggregate outcome data for ELLs (e.g., Klingner, Vaughn, & Schumm, 1998).
2. Studies were accepted that included an experimental or quasi-experimental treatment–comparison design, a single-case design (SCD), or a preexperimental single group design (Campbell & Stanley, 1966).

3. Studies were included in which students implemented a structured PMI (e.g., peer pairing/peer tutoring; cooperative/collaborative grouping) as a treatment. Studies were excluded if students were not taught to implement a systematic PMI procedure with peers. For instance, studies were excluded if peers were simply assigned to work collaboratively in a peer pairing or peer grouping arrangement and left to structure the group on their own (e.g., MacArthur, Ferretti, & Okolo, 2002).
4. Studies were accepted that reported an academic outcome (e.g., reading fluency, reading comprehension, content knowledge). Studies were excluded that only reported oral language development outcomes (e.g., number of utterances; August, 1987).
5. Studies were accepted that were published in English and were conducted in U.S. schools.

Twelve studies met the inclusion criteria. A search of the references of the three previous reviews of PMIs (Cole, 2013; Lou et al., 1996; Puzio & Colby, 2013) yielded an additional study. One additional study was also located through the ancestral search of all included studies. A hand search of the following nine journals from which a majority of the studies were located was completed for 2012 to 2013: *Bilingual Research Journal, Exceptional Children, Journal of Learning Disabilities, Journal of Research on Educational Effectiveness, Journal of Special Education, Learning Disability Research & Practice, Learning Disability Quarterly, Remedial and Special Education*, and *TESOL Quarterly.* No additional studies were located through the hand search. In sum, a total of 14 studies, reported in peer-reviewed journals between 1983 and 2013, met the criteria for inclusion in this synthesis. A majority of the studies were conducted between 2005 and 2009.

Coding Procedures

An extensive code sheet was developed based on elements specified in the *What Works Clearinghouse Procedures and Standards Handbook* (Version 3.0; WWC, 2014). The code sheet was used to organize the following essential information: (a) participants, (b) methodology, (c) intervention and comparison information, (d) clarity of causal inference, (e) measures, and (f) findings. The code sheet included a combination of forced-choice items (e.g., research design, assignment method), open-ended items (e.g., age of participants, duration of intervention, PMI type), and written description of the treatment and comparison conditions.

Four raters were trained on the use and interpretation of items from the code sheet for a total of 5 hours. Each rater independently coded the same article and point-by-point agreement was calculated until interrater reliability of 100% was attained on one article. The remaining studies were divided among raters. Each article was independently coded and double coded by a second rater to check for accuracy. The mean interobserver agreement (IOA) index (i.e., agreements divided by agreements plus disagreements) was 93% with a range of 86% to 100%. When disagreements occurred, raters reached consensus on how to code the particular item.

Effect Size Calculation

To provide additional quantitative information effect sizes were calculated using Cohen's *d*. Cohen's *d* was calculated as the difference between the mean posttest score of the participants in the intervention condition and the mean posttest score of the participants in the comparison condition divided by the pooled standard deviation (Cooper, Hedges, & Valentine, 2009). Effect sizes were obtained for all group design studies in which data were available. We interpreted an effect size of $d = 0.20$ as small, $d = 0.50$ as medium, and $d = 0.80$ as large (Cohen, 1988).

Quality Standards

The seven standards used to assess the methodological quality of experimental, quasi-experimental, and SCD studies were derived from Gersten et al. (2005), Horner et al. (2005), and WWC (2014). For experimental and quasi-experimental studies, this review included randomization and attrition from the WWC group design standards. Additional methodological quality indicators included whether the researchers described fidelity of implementation procedures, thoroughly described intervention and comparison conditions, used multiple outcome measures, used standardized measures, and computed an effect size (Gersten et al., 2005).

Quality indicators for SCD studies were developed based on both the Horner et al. (2005) and WWC (2014) design and evidence standards. SCD studies were evaluated on the strength of the research design to ensure adequate internal validity and the strength of evidence through visual analysis as proposed by the WWC. The WWC design standards include the following: (a) the intervention was systematically manipulated, (b) the dependent variable was measured repeatedly, (c) IOA was assessed for a minimum of 20% of all sessions, (d) IOA met a minimum of 80% agreement/reliability across all sessions, (e) an adequate number of replications were demonstrated, and (f) a minimum of three data points were present in each phase. Additionally, we included Horner et al.'s (2005) criteria to evaluate whether the fidelity of the independent variable was measured during the intervention phase. For this review, high-quality group and SCD studies were those that met a minimum of six of the seven quality indicators.

Results

Data Analysis Plan

This synthesis includes a range of study designs and PMI types. First, we address Research Question 1 by synthesizing study characteristics, including intervention features, and highlight similarities and differences across the corpus of studies. Second, we summarize the effects of PMIs on academic outcomes (Research Question 2) by intervention type (i.e., peer pairing and collaborative/cooperative). Finally, we report the methodological quality of the PMI studies (Research Question 3), and summarize the overall findings of the high-quality studies of PMIs with ELLs.

Characteristics of Peer-Mediated Interventions With ELLs in Grades K–12

The characteristics of the PMI studies are summarized in Table 1. The 14 studies included a total of 1,777 students of which 1,092 (61%) were ELLs. A total of 934 ELLs participated in the treatment–comparison studies (1,595 students participated overall), 145 ELLs participated in the SCD studies, and 13 ELLs participated in the single-group study (37 students participated overall). Sample sizes ranged from 12 to 507. Slightly less than half of the student sample ($n = 866$) were in the elementary grades (K–6; $n = 11$ studies), and 915 students were in secondary grades (7–12; $n = 3$ studies). Third graders were included the most often ($n = 6$ studies), and kindergarteners and eighth graders were included the least often ($n = 1$ study). PMIs with ELLs were evaluated with students in every grade level from Grades K–8. No researchers investigated the effects of PMIs with ELLs in Grades 9 to 12.

In nine studies, researchers reported ethnicity: 66% ($n = 560$) of the participants were Hispanic; 7% ($n = 57$) were White; 6% ($n = 51$) were Black; 1% ($n = 10$) were Asian; and 19% ($n = 164$) were not reported or were reported as non-Hispanic. In six studies, researchers included students with disabilities. In three of the studies (Klingner & Vaughn, 1996, 2000; Sáenz, Fuchs, & Fuchs, 2005), researchers specifically indicated that they included ELLs with a learning disability (LD) in the treatment condition ($n = 36$).

Language Proficiency

In seven studies, the authors reported on ELLs' performance on language proficiency measures. Researchers in four studies (i.e., Almaguer, 2005; Klingner & Vaughn, 2000; Madrid, Canas, & Ortega-Medina, 2007; Madrid, Canas, & Watson, 2003) included the Language Assessment Scale (LAS; De Avila & Duncan, 1984). Researchers in the remaining three studies (Calhoon, Al Otaiba, Cihak, King, & Avalos, 2007; McMaster, Kung, Han, & Cao, 2008; Sáenz et al., 2005) reported ELLs' performance on different language proficiency measures. These included the Woodcock–Muñoz Language Survey–Revised (WMLS; Woodcock & Muñoz-Sandoval, 1993), the IDEA Proficiency Test (Ballard, Dalton, & Tighe, 1995), and the Student Oral Language Observation Matrix (SOLOM; Minnesota Department of Education, 2003).

Academic Skill Area

PMIs were used in five academic skill areas: reading ($n = 6$ studies), social studies ($n = 3$ studies), spelling ($n = 3$ studies), science ($n = 1$ study), and writing ($n = 1$ study). No researchers investigated the effects of PMIs with ELLs in mathematics.

Language of Instruction

In four studies, researchers reported that English was the language of instruction. In seven studies, both English and Spanish were used during instruction (Calderón, Hertz-Lazarowitz, & Slavin, 1998; Calhoon et al., 2007; Greenwood, Arreaga-Mayer, Utley, Gavin, & Terry, 2001; Klingner & Vaughn, 1996, 2000;

TABLE 1

Characteristics of peer-mediated intervention studies

Study	Participants	Language proficiency	Grade and content	Ethnicity	Duration	Grouping	Language of instruction
Peer pairing: Treatment–comparison designs							
1. Almaguer (2005)	$N = 80$	LEP: 100% as measured by the LAS	3; Reading	$n = 80$ H	45, 30-minute sessions plus 60 minutes of ELA, daily for 9 weeks	Strategically matched on pretest fluency, HR:LR; $n = 1{:}1$	English; transitional (early exit) bilingual education classrooms
2. Vaughn et al. (2009): Study 1	$N = 381$; FRL: 70%–82%	LEP: $M = 13\%$; T: ELL = 52%; C: ELL = 48%	7; Social studies	$n = 248$ H; $n = 133$ NR	12–20 minutes of peer-mediated work during 50-minute sessions daily for 9–12 weeks	Strategically matched on LEP status and state reading test, LEP:NLEP; $n = 1{:}1$	Spanish used during vocabulary instruction
3. Vaughn et al. (2009): Study 2	$N = 507$; FRL: $M = 77\%$	LEP: $M = 17\%$; T: ELL: 63%; C: ELL: 37%	7; Social studies	$M = 58\%$ H (school)	12–20 minutes of peer-mediated work during 50-minute sessions daily for 9–12 weeks	Strategically matched on LEP status and state reading test, LEP:NLEP; $n = 1{:}1$	Spanish used during vocabulary instruction
Peer-assisted learning opportunities							
4. Calhoon, Al Otaiba, Cihak, King, and Avalos (2007)	$N = 76$; T: SE: $n = 40$; C: SE: $n = 25$; FRL: >80%	LEP: 28%; EP: 72% as measured by IPT	1; Reading	T: $n = 33$ H; T: $n = 10$ W; C: $n = 27$ H; C: $n = 6$ W	60, 30- to 35-minute sessions during 135-minute ELA block, 3/week for 20 weeks	Strategically matched, HR:LR; $n = 1{:}1$	English and Spanish; 50/50 two-way bilingual immersion program
5. Calhoon, Al Otaiba, Greenberg, King, and Avalos (2006)	$N = 78$; T: SE: $n = 0$; C: SE: SLD: $n = 6$; FRL: >75%	SSB: 68%; EM: 32%	1; Reading	T: $n = 25$ H; T: $n = 16$ NH; C: $n = 24$ H; C: $n = 13$ NH	60, 30- to 35-minute sessions during 60-minute reading block, 3/week for 20 weeks	Strategically matched, HR:LR; $n = 1{:}1$	English; parents chose English only when given a choice of Spanish or English

(continued)

TABLE 1 (continued)

Study	Participants	Language proficiency	Grade and content	Ethnicity	Duration	Grouping	Language of instruction
6. McMaster, Kung, Han, and Cao (2008)	*N* = 60; T1: SE: *n* = 0; T1: FRL: *n* = 12; T2: SE: *n* = 1; T2: FRL: *n* = 12; C: SE: *n* = 1; C: FRL: *n* = 11	T1: ELL: 100%; T2: ELL: 0%; C: ELL: 100%; T1: *M* = 3.05; C: *M* = 3.45 as measured by the student oral language observation matrix	K; Reading	T1: *n* = 7 A/I; T1: *n* = 4 B; T1: *n* = 8 H; T1: *n* = 0 W; T1: *n* = 1 O; T2: *n* = 1 A/I; T2: *n* = 11 B; T2: *n* = 1 H; T2: *n* = 6 W; T2: *n* = 1 O; C: *n* = 16 A/I; C: *n* = 1 B; C: *n* = 2 H; C: *n* = 1 W; C: *n* = 0 O	72, 20- to 30-minute sessions, 4/week for 18 weeks	Strategically matched, HR:LR; pairs rotated 3–4 weeks; *n* = 1:1	English
7. Sáenz, Fuchs, and Fuchs (2005)	*N* = 119; T: HA: *n* = 17; T: AA: *n* = 17; T: LA: *n* = 15; T: SE: LD: *n* = 10; C: HA: *n* = 14; C: AA: *n* = 18; C: LA: *n* = 18; C: SE: LD: *n* = 10	SSB: 100%; ELL: 100%; T: LEP: *M* = 3.07; C: LEP: *M* = 3.17 as measured by WMLS	3–6; Reading	NR	45, 35-minute sessions, 3/week for 15 weeks	Strategically matched on observations and assessment scores, HR:LR; pairs rotated 3–4 weeks; *n* = 1:1	English; transitioned from Transitional bilingual education classrooms
Peer pairing: Single-case designs							
Classwide peer tutoring							
8. Greenwood, Arreaga-Mayer, Utley, Gavin, and Terry (2001)	*N* =117 (5 classrooms)	ELL: 100%	1–5; Spelling	*n* = 7 A; *n* = 35 B; *n* = 34 W; *n* = 41 H	30-minute sessions, 3–4/week for 15–21 weeks	Strategically matched, students new to the United States were paired with SSB; HR:LR; *n* = 1:1	English and Spanish; ESL self-contained classroom and partial immersion for LEP

(continued)

TABLE 1 (continued)

Study	Participants	Language proficiency	Grade and content	Ethnicity	Duration	Grouping	Language of instruction
9. Madrid, Canas, and Ortega-Medina (2007)	$N = 16$; SES: low income	LEP: 100% scored a 3 or less on LAS in English; SSB: 100% scored 4 or 5 in Spanish and were considered proficient	3; Spelling	100% H	75, 20-minute sessions, daily for 15 weeks; each of the 3 conditions were randomly presented for 1 week, for a total of 5 times during a 15-week experimental period	Strategically matched, HR:LR; $n = 1:1$	NR
10. Madrid, Canas, and Watson (2003)	$N = 12$	LEP: 100% scored a 3 or less on LAS in English; SSB: 100% scored 4 or 5 in Spanish and were considered proficient	3; Spelling	100% H	75, 15-minute sessions, daily for 15 weeks; each of the 3 conditions were randomly presented for 1 week, for a total of 5 times during a 15-week experimental period	Strategically matched, HR:LR; $n = 1:1$	NR
Collaborative/cooperative groups: Treatment–comparison designs							
11. Calderón, Hertz-Lazarowitz, and Slavin (1998)	$N = 222$	SSB: 100%; T: LEP: $M = 45\%$; C: LEP: $M = 46\%$ (school)	2, 3; Reading	T: $M = 96\%$; C: $M = 97\%$ (school)	30 minutes of ESL plus 90 minutes of reading/ language instruction, daily for the entire school year	Heterogeneous; $n = 4$	English and Spanish; transitional bilingual education classrooms
12. Prater and Bemudez (1993)	$N = 46$	LEP: 100%	4; Writing	T: $n = 25$ H; T: $n = 2$ A; C: $n = 18$ H; C: $n = 1$ A	3 weeks	Heterogeneous; $n = 4–5$; LEP: $n = 1–3$/group	NR; students were previously in ESL or SSB classes

(continued)

TABLE 1 (continued)

Study	Participants	Language proficiency	Grade and content	Ethnicity	Duration	Grouping	Language of instruction
Collaborative strategic reading							
13. Klingner and Vaughn (1996)	*N* = 26; SE: LD: 100%	ESL: 100%; students were native Spanish speakers	7, 8; Social studies	89% H (school)	27, 35- to 40-minute sessions for 6 weeks	Heterogeneous reciprocal: *n* = 6–7; T1: *n* = 1:1; T2: *n* = 3–5	English; students were encouraged to use Spanish to assist in understanding
Collaborative/cooperative groups: Single-group design							
Collaborative strategic reading							
14. Klingner and Vaughn (2000)	*N* = 37; SE: LD: *n* = 2; FRL: 75%	SSB: 95%; LEP: 35%; *M* = 2.38 as measured by LAS	5; Science	94% H (school)	30- to 40-minute sessions, 2–3/week for 4 weeks	Heterogeneous; *n* = 6–7; LEP: *n* = 2–3/group	English; vocabulary and key concepts were translated to Spanish

Note. LD = learning disabilities; T = treatment; C = control; SE = special education; SLD = speech and language delay; EP = English proficient; LEP = limited English proficient; NLEP = non-LEP; EM = English monolingual; NR = not reported; *M* = mean; A/I = Asian/Indian; A = Asian; B = Black; H = Hispanic; NH = Non-Hispanic; W = White; O = Other; ESL = English as a second language; SSB = Spanish-speaking bilingual; LAS = Language Assessment Scales; WMLS = Woodcock–Muñoz Language Survey; IPT = IDEA Proficiency Test; ELA = English language arts; HR = higher reader; LR = lower reader; HA = higher achieving; AA = average achieving; LA = lower achieving; ELL = English language learner; FRL = free and reduced-price lunch; K = kindergarten; SES = socioeconomic status. The numbers reported are those for English language learners unless otherwise indicated.

Vaughn et al., 2009: Study 1 and Study 2). For instance, in the Klingner and Vaughn (2000) study, the authors indicated that vocabulary words and key concepts were translated into Spanish. It is possible that Spanish was spoken in the classroom even though English was the language of instruction. Klingner and Vaughn (1996) stated that even though instruction was provided in English, students were encouraged to use their native language (i.e., Spanish). Similarly, Almaguer (2005) and Calderón et al. (1998) reported that English was the primary language of instruction in a bilingual program and Greenwood et al. (2001) specified that ELLs were educated in an ESL self-contained classroom with partial immersion. Spanish was used during vocabulary instruction in Vaughn et al. (2009: Study 1 and Study 2). In three studies, researchers did not report the language of instruction (Madrid et al., 2003; Madrid et al., 2007; Prater & Bemudez, 1993).

Intervention Duration and Session Length

The corpus of studies included a range of intervention durations and length of intervention sessions. In 12 of the 14 studies, researchers reported the number of sessions implemented (range = 27 sessions to 75 sessions; Klingner & Vaughn, 1996, Madrid et al., 2003; Madrid et al., 2007, respectively). In seven studies, researchers reported that interventions lasted 15 weeks or longer. The longest intervention was implemented daily for the entire school year (Calderón et al., 1998). Prater and Bemudez (1993) reported the shortest intervention duration, 3 weeks. In 13 studies, researchers reported the number of sessions implemented per week (range = 2 days per week to daily sessions). In six studies, researchers implemented PMIs daily. In contrast, Klingner and Vaughn (2000) implemented their PMI two to three times per week, while Greenwood et al. (2001) implemented their PMI three to four times per week. In 13 of the 14 studies, researchers reported the length of individual sessions. In four studies, the intervention session ranged from 12 to 20 minutes, while in 9 studies, sessions ranged from 30 to 40 minutes.

Peer-Mediated Grouping Arrangements

Researchers reported varying numbers of students that were grouped to participate in PMIs. In 10 of the 14 studies, students were grouped in dyads. Calderón et al. (1998) reported that students were grouped in teams of four and Prater and Bemudez (1993) reported that peers were grouped in teams of four to five. Klingner and Vaughn (1996, 2000) reported that students were grouped in teams of six to seven.

Researchers matched students heterogeneously in all the studies in this review. In all peer pairing studies, researchers strategically matched students. For example, in eight studies researchers rank-ordered all the students in the class on ability level (e.g., reading achievement) and paired higher achieving students with lower achieving students. In two studies, Vaughn et al. (2009) matched ELLs with their non-ELL peers based on reading test scores. Finally, in three of the four collaborative/cooperative grouping studies, researchers ensured ELL peers were included in each group. Calderón et al. (1998) did not describe a specific process for how students were heterogeneously matched.

The outcomes of each study are organized by the type of PMI and summarized in Supplemental Table S1 (in the online version of the journal). First, we describe the findings from the peer pairing intervention studies and then the collaborative/cooperative grouping intervention studies. Within each section, we report effect sizes from the treatment–comparison design studies followed by findings from the preexperimental single-group and SCD studies, when applicable.

Peer Pairing

In 10 of the 14 studies, researchers used a peer pairing/peer tutoring format. Vaughn et al. (2009: Study 1 and Study 2) covered the same material using the same textbook during the same time in the treatment and comparison conditions. The treatment in Study 1 and in Study 2 included vocabulary instruction, brief videos and purposeful discussion, use of graphic organizers, and structured peer pairing as components of a PMI designed to improve reading of social studies content. In both studies, Vaughn et al. (2009) reported large effects on researcher-developed measures of comprehension for ELLs in the treatment conditions (effect size [ES] = 0.72, 0.84, respectively) as compared to ELLs in the comparison condition. On the vocabulary measures, medium effects were reported for ELLs in Study 1 (ES = 0.64) and in Study 2 (ES = 0.50) as compared to ELLs in the comparison condition. In conclusion, in both studies, Vaughn et al. (2009) reported medium to large effects on researcher-developed measures of comprehension and vocabulary for ELLs compared to ELLs in the comparison condition.

Almaguer (2005) implemented dyad reading as the treatment using the same curriculum and instructional minutes as the teacher-mediated comparison condition. In the dyad reading condition, the student with the higher reading level selected the basal reader and read aloud, while the student with the lower reading level read in unison. Medium to large effects were found for ELLs on the Comprehensive Reading Assessment Battery (CRAB) standardized measure of fluency (ES = 0.69) and reading comprehension (ES = 0.70) as compared to ELLs in the comparison condition. Also, small effects were found on the close reading comprehension measure (ES = 0.33).

Peer-assisted learning strategies. In four treatment–comparison studies, researchers compared PALS to school-implemented reading activities. The researchers implemented variations of PALS dependent on their participants' grade level, including K-PALS, first-grade PALS, and PALS in Grades 3 to 6. Sáenz et al. (2005) engaged peers in Grades 3 to 6 in Partner Reading with story retell, paragraph shrinking by summarizing the main points in paragraphs, and making story predictions. Dyads progressively added peer-mediated reading components during the intervention and received points for accurate and high-quality work. In general, ELLs in the PALS condition outperformed their ELL peers in a teacher-mediated instruction comparison condition. Effect sizes ranged from medium to very large on three measures of the CRAB, maze (ES = 0.40), words correct (ES

= 0.60), and questions correct (ES = 1.02). In a secondary analysis, data were disaggregated by four ELL learner types: high achievers, average achievers, low achievers, and learning disabled. ELLs of all learner types, with the exception of the average achievers on the maze, outperformed the comparison condition on each of the three CRAB measures.

In two studies, Calhoon et al. (2006, 2007) strategically matched first graders in dyads and had them focus on beginning reading activities, sounds and words, and story sharing including previewing, predicting, taking turns while reading, and retelling with peers. In both studies, ELLs received the district's mandated core reading program in the teacher-mediated comparison group with supplemental repeated reading and phonics instruction using grade-appropriate materials (Calhoon et al., 2006) and with supplemental whole-group reading (Calhoon et al., 2007). Calhoon et al. (2006) reported mixed effects for ELLs on the Dynamic Indicators of Basic Early Literacy Skills oral reading fluency (ES = −0.06), nonsense word fluency (ES = 0.74), and phoneme segmentation fluency (ES = 0.73) as compared to the comparison condition. Mixed effects were also found for ELLs on the same measures in Calhoon et al. (2007), oral reading fluency (ES = 0.38), nonsense word fluency (ES = 1.31), and phoneme segmentation fluency (ES = −0.06), and very large effects were reported on Dynamic Indicators of Basic Early Literacy Skills letter naming fluency (ES = 1.18). Notably, there were twice as many ELLs in the 2007 study compared to the 2006 study.

McMaster et al. (2008) compared two treatment conditions of K-PALS (with ELLs and with non-ELLs, respectively) with typical school practice (with ELLs). In the treatment conditions, dyads practiced phonics activities, sentence reading, and error correction, in addition to teacher-mediated phonemic awareness activities. ELLs who participated in K-PALS outperformed ELLs in the control condition on three standardized measures, spelling (ES = 0.04), word identification (ES = 0.11), and word attack (ES = 0.22). On researcher-developed measures of phonemic awareness, rapid letter sounds, and oral reading, effect sizes ranged from 0.10 to 0.69 favoring ELLs in the K-PALS condition compared to ELLs in the control condition.

Classwide peer tutoring (CWPT). In three SCD studies, researchers implemented CWPT and examined outcomes on researcher-developed spelling measures. Greenwood et al. (2001) implemented CWPT in a reciprocal tutoring format where the tutee read and wrote the word while the tutor read the words and provided corrective feedback and praise when appropriate. In addition to a researcher-developed spelling measure, Greenwood et al. assessed ELLs' sight word vocabulary in one classroom. Over the course of the entire study, ELLs demonstrated a 60% mean increase (from pretest to posttest) in the four classes that addressed spelling and in the first-grade class of nonreaders that addressed sight word vocabulary.

Madrid et al. (2003) compared passive CWPT, active CWPT, and teacher-mediated instruction. In passive CWPT, the tutee watched and listened while the tutor read and wrote the spelling words, provided prompts to the tutee to pay attention, and gave praise when appropriate. In active CWPT, the tutee wrote and

spelled the spelling words while the tutor read the words and provided corrective feedback and praise when appropriate. Teachers focused on the same reading, writing, and spelling activities as used in the CWPT conditions and implemented them across the 5 school days. ELLs in the passive CWPT and active CWPT conditions demonstrated almost equivalent spelling scores from pretest to posttest (51% score increase compared to 50% score increase, respectively) whereas ELLs in the teacher-mediated condition gained 27%.

Madrid et al. (2007) replicated their 2003 study but varied how students earned points for their accurate work in the CWPT conditions. ELLs in the competitive CWPT teams accumulated points only for their individual team, whereas ELLs in the cooperative CWPT teams accumulated points for all participants across all teams. Similar to the 2003 study, teachers focused on the same activities as in the CWPT conditions and implemented them across the 5 school days. ELLs in cooperative CWPT teams demonstrated an 81% increase on spelling scores from pretest to posttest while ELLs in the competitive CWPT teams demonstrated a 67% gain whereas ELLs in the teacher-mediated condition demonstrated a 22% increase.

In summary, the peer pairing intervention studies included peer tutoring, PALS, and CWPT. Researchers in four studies included ELLs in about half of their sample whereas researchers in the other six studies included only ELLs. Overall, ELLs who participated in peer pairing interventions demonstrated gains on standardized and researcher-developed measures of phonemic awareness, fluency, spelling, vocabulary, and reading comprehension.

Collaborative/Cooperative Interventions

In four treatment–comparison studies, researchers examined three different collaborative/cooperative PMIs. Calderón et al. (1998) examined Bilingual Cooperative Integrated Reading and Composition (BCIRC) compared to a control intervention that focused on round robin reading, and independent workbook activities and occasionally used cooperative learning strategies. ELLs in the BCIRC condition outperformed ELLs in the control condition on a state standardized measure of reading (ES = 0.58) and language (ES = 0.29).

Prater and Bemudez (1993) implemented a peer-mediated writing process to compose a weekly paper. In the peer response groups, students provided guidance to their peers, including topic selection, commentary on strengths and weaknesses, and help with revisions and editing. In the comparison condition, students worked individually to select a topic, compose a paper, and revise their drafts for submission based on the teacher's edits. ELLs in the peer response groups outperformed ELLs in the comparison condition on composition (ES = 0.19), number of idea units (ES = 0.30), number of words (ES = 0.63), and number of sentences (ES = 0.37).

Collaborative strategic reading (CSR). Klingner and Vaughn (1996) compared reciprocal teaching plus cross-age tutoring to reciprocal teaching plus cooperative learning. Reciprocal teaching focused on predicting, brainstorming, clarifying word understanding, main idea identification, summarization, and questioning. In reciprocal teaching plus tutoring, dyads practiced

comprehension strategies and in reciprocal teaching plus cooperative learning students practiced comprehension strategies in cooperative groups. ELLs in the reciprocal teaching plus cooperative learning condition outperformed ELLs in the reciprocal teaching plus tutoring condition on a standardized measure of reading comprehension (ES = 1.42). However, ELLs in the reciprocal teaching plus tutoring condition outperformed ELLs in the reciprocal teaching plus cooperative learning condition on a researcher-developed passage comprehension measure (ES = 0.35). In the Klingner and Vaughn (2000) single-group study, ELLs engaged in a reading comprehension strategy that focused on reading text aloud, vocabulary, and discussion in collaborative groups with rotating roles. On two researcher-developed vocabulary measures for two science chapters, ELLs demonstrated large vocabulary gains from pretest to posttest (ES = 1.08 and 1.05, respectively).

In summary, the collaborative/cooperative grouping studies included a collaborative writing process, BCIRC, and CSR. Klingner and Vaughn (2000) included ELLs in about half of their sample whereas researchers in the other three studies included only ELLs. ELLs who participated in collaborative/cooperative PMIs demonstrated gains on standardized measures of language and reading comprehension and researcher-developed measures of writing, vocabulary, and reading comprehension.

Methodological Quality of Peer-Mediated Interventions That Address Academic Outcomes of ELLs in Grades K–12

Researchers used an experimental or quasi-experimental design in 10 studies, an SCD in 3 studies, and a preexperimental single-group design in one study. We highlight the methodological quality of the experimental and quasi-experimental studies in Table 2 and the quality of the SCD studies in Table 3. Klingner and Vaughn's (2000) preexperimental single-group design is subject to numerous threats to internal validity (e.g., history, maturation, testing, and instrumentation) and was not evaluated for quality.

A total of 8 of the 14 studies, all featuring treatment–comparison research designs, met at least six of seven quality indicators and were rated as studies with high methodological quality (i.e., Almaguer, 2005; Calhoon et al., 2006, 2007; Klingner & Vaughn, 1996; McMaster et al., 2008; Sáenz et al., 2005; Vaughn et al., 2009: Study 1 and Study 2). Of the eight studies with high methodological quality, researchers in seven studies used random assignment at the student, classroom, or teacher level. Furthermore, researchers in all these studies reported information on fidelity of implementation. In all eight high-quality treatment–comparison studies, researchers described the treatment conditions thoroughly, reported the use of multiple outcome measures, and provided an effect size or enough data to compute an effect size, and attrition was computable and at acceptable rates (<30%). In six of the eight high-quality studies, researchers used at least one standardized measure.

Overall, the three SCD studies in this review have serious methodological design flaws and do not meet our minimum of six of seven quality indicators. Madrid et al. (2003) and Madrid et al. (2007) systematically manipulated the independent variable by alternating the students through three different treatments

TABLE 2

Quality indicators of treatment–comparison studies

Study	RA	FOI	IV	MO	SM	ES	Attrition
Peer pairing							
1. Almaguer (2005)	CC	✓	✓	✓	✓	✓	✓
2. Calhoon, Al Otaiba, Cihak, King, and Avalos (2007)	TC	✓	✓	✓	✓	✓	✓
3. Calhoon, Al Otaiba, Greenberg, King, and Avalos (2006)	CC	✓	✓	✓	✓	✓	✓
4. McMaster, Kung, Han, and Cao (2008)	—	✓	✓	✓	✓	✓	✓
5. Sáenz, Fuchs, and Fuchs (2005)	CC	✓	✓	✓	✓	✓	✓
6. Vaughn et al. (2009): Study 1	SCL, CC	✓	✓	✓	—	✓	✓
7. Vaughn et al. (2009): Study 2	SCL, CC	✓	✓	✓	—	✓	✓
Collaborative/cooperative groups							
8. Calderón, Hertz-Lazarowitz, and Slavin (1998)	—	—	✓	✓	✓	✓	✓
9. Klingner and Vaughn (1996)	SC	✓	✓	✓	✓	✓	✓
10. Prater and Bemudez (1993)	CC	—	✓	✓	—	✓	✓

Note. RA = random assignment; FOI = fidelity of implementation reported; IV = independent variable and comparison condition described thoroughly; MO = multiple outcome measures used; SM = standardized measure used; ES = article provided effect size or enough data to compute effect size; Attrition = attrition computable and at acceptable rates (<30%); SC = RA of students to condition; SCL = RA of students to classes; CC = RA of classes to condition; TC = RA of teachers to condition. A check mark indicates that evidence was present. A dash indicates that evidence was not present.

TABLE 3

Quality indicators of single-case–design studies

Study, peer pairing	Systematically manipulated IV	DV measured repeatedly	IOA for ≥ 20%	IOA at ≥ 80%	FOI	Attempts for Tx effect	Data points per phase	WWC Study rating
1. Greenwood, Arreaga-Mayer, Utley, Gavin, and Terry (2001)	—	✓	✓	✓	✓	—	✓	Does not meet standards
2. Madrid, Canas, and Ortega-Medina (2007)	✓	✓	—	—	—	✓	—	Does not meet standards
3. Madrid, Canas, and Watson (2003)	✓	✓	✓	✓	—	—	—	Does not meet standards

Note. IV = independent variable; DV = dependent variable; IOA = interobserver agreement; FOI = fidelity of implementation; Tx = treatment; WWC = What Works Clearinghouse. A check mark indicates that evidence was present. A dash indicates that evidence was not present.

over 5 weeks. They also measured the dependent variable repeatedly by administering pretests and posttests to measure spelling achievement on five separate occasions. Although Madrid and colleagues reported reliability in their 2003 study, they failed to report IOA percentages in their 2007 study. Moreover, in both studies, Madrid et al. reported fidelity during training and noted that the researchers and classroom teachers independently approached the tutoring dyads to ensure tutoring procedures were being implemented but did not report fidelity data during the treatment phases. Finally, Madrid et al. (2003; Madrid et al., 2007) did not include graphs for each participant. They reported mean spelling results across students in bar graphs during the three conditions under investigation. Thus, neither study met the criteria to assess effectiveness of the intervention for individual students.

In the other SCD, Greenwood et al. (2001) employed an AB design (A = baseline implementation of CWPT learning management system; B = CWPT learning management system plus consultation, progress-based decision making, and feedback) across five classrooms. Greenwood and colleagues measured the dependent variable repeatedly, reported acceptable levels of IOA, included acceptable levels of data points per phase, and used a 40-item checklist to assess fidelity of the intervention. However, Greenwood and colleagues did not systematically manipulate their peer-mediated treatment. Although the replications across classrooms are notable, without a reversal/withdrawal phase or a multiple baseline design, the AB design is subject to numerous threats to internal validity. Although we were

unable to determine the effectiveness of this study, the authors presented class growth spelling mean improvement, and in one class, mean vocabulary improvement, from pretest to posttest.

None of the SCD studies reviewed in this article met the minimum number of quality design standards to assess the strength of evidence of a causal relationship using the WWC (2014) evidence standards. Thus, we did not synthesize the results of these studies or the preexperimental single-group design to determine the overall evaluation of PMIs in the next section.

Overall Evaluation of Peer-Mediated Interventions With ELLs

There is an emerging body of literature of PMIs with ELLs that includes high-quality experimental studies ($n = 6$) and quasi-experimental studies ($n = 2$). Seven of the eight studies that had high methodological quality ratings included peer pairing that resulted in small to large effect sizes favoring PMI conditions. These outcomes are consistently found with standardized measures and researcher-developed measures that resulted in mostly medium to large effects on phonemic awareness, vocabulary, and comprehension outcomes when compared to teacher-mediated comparison conditions (ES: 0.33–1.31). Also, these PMIs were often associated with improved fluency and decoding for ELLs when compared to teacher-mediated comparison conditions (ES: 0.10–0.69). On a less consistent basis, researchers report a wide range of effects on standardized measures of phoneme segmentation (ES: −0.06–0.73), fluency (ES: −0.06–0.69), and comprehension (ES: 0.33–1.42; Almaguer, 2005; Calhoon et al., 2006, 2007; Klingner & Vaughn, 1996). Researchers also report positive effects on researcher-developed measures of vocabulary (ES: 0.50–0.64) and comprehension (ES: 0.35–0.84; Klingner & Vaughn, 1996; Vaughn et al., 2009). Last, when separated by PMI model, 70% of the peer pairing studies had high methodological quality ratings, whereas only 25% of the collaborative/cooperative grouping studies had high methodological quality ratings (see Table 2). In general, the studies that did not meet our high quality standards resulted in similar outcomes as the high-quality studies.

Discussion

In this systematic review of 14 studies, we analyzed the effects of PMIs implemented with ELLs in Grades K–12. In general, over half the studies reviewed in this article were considered to be of high methodological quality and the PMIs resulted in favorable academic outcomes for ELLs. This finding is discussed below relative to the methodological quality and effectiveness of the PMI studies within the context of the two types of PMI models, peer pairing and collaborative/cooperative grouping. We then discuss the PMI characteristics that resulted in improved academic outcomes of ELLs. We conclude with implications and future research of PMIs with ELLs.

Methodological Quality and Effectiveness of Peer-Mediated Interventions

Many of the PMI studies included in this review met the established high quality criteria (see Tables 2 and 3). From these studies we can conclude that PMIs are effective interventions with ELLs for improving phonemic awareness, fluency,

comprehension, and vocabulary outcomes. Specifically, we found that PALS mostly produced medium to large effects on phonemic awareness, fluency, and comprehension outcomes for ELLs in Grades K, 1, and 3 to 6. Similarly, the WWC (2010a) reported that PALS had potentially positive effects on reading achievement for ELLs in Grades 3 to 6. Finally, we found that structured PMIs that included elements of PALS or CWPT (e.g., paired reading) resulted in large effects on reading comprehension and medium effects on vocabulary (e.g., Vaughn et al., 2009) and fluency (e.g., Almaguer, 2005). Thus, it appears that PMIs that include paired reading aloud, repeated reading, reading with questioning, previewing, predicting, reciprocal reading, retelling, and error correction are likely to produce positive academic outcomes for ELLs in phonemic awareness, fluency, vocabulary, and comprehension.

We cannot confidently conclude that PMIs with ELLs improve their spelling performance, written compositions, and statewide tests in reading and language given the methodological quality of the reviewed research. Furthermore, we cannot draw conclusions about the effectiveness of CWPT with ELLs due to the methodological quality of the available research. The WWC (2010a) also could not draw conclusions about the effectiveness of CWPT with ELLs because no studies using CWPT with ELLs met the WWC quality criteria. Additional studies conducted with high methodological quality are required to confirm the effectiveness of PMIs, specifically CWPT, with ELLs in spelling and writing and on statewide measures of reading and language.

In previous reviews, researchers reported that substantially more studies included researcher-developed measures than standardized measures (Stenhoff & Lignugaris/Kraft, 2007; Wexler et al., 2015). In contrast, we found that standardized measures were used in half of the peer pairing studies and half of the collaborative/cooperative grouping PMI studies. Researchers in few studies in this review reported ELL outcomes on both standardized and researcher-developed measures. Standardized test outcomes are generally more distal to the target outcomes than researcher-developed measures; therefore, large effect sizes on these measures suggest a broader achievement impact than the intervention specific outcomes typically measured using researcher-developed measures. In this review, researchers reported large effects of PMIs on standardized measures of reading comprehension in three high-quality studies. In four additional high-quality studies, researchers reported mixed effects on standardized measures of phonemic awareness and fluency. This strengthens the conclusion that PMIs with ELLs will result in improved reading comprehension; however, we assert that more research should explore the effects of PMIs with ELLs on standardized measures of phonemic awareness and fluency.

Measurement of fidelity is a study design feature that researchers are more recently including in their research designs. In fact, Okilwa and Shelby (2010) and Wexler et al. (2015), in their syntheses of PMIs with students with disabilities, reported that nearly all the studies they reviewed included fidelity of implementation. Similarly, in most studies, we found that researchers reported fidelity of implementation. Only a few years earlier, Stenhoff and Lignugaris/Kraft (2007) reported that fewer than half of the researchers in their review of PMIs with students with disabilities reported fidelity of implementation. Although the inclusion

of measurement of fidelity is an important quality indicator that researchers are increasingly accounting for in their design, there are various ways to measure and report fidelity in PMI research. For instance, some researchers reported fidelity of implementation collected during tutor training (e.g., Calhoon et al., 2006), whereas other researchers reported fidelity data collected during program implementation (e.g., Greenwood et al., 2001), and some researchers reported fidelity data collected during both training and implementation (e.g., Calhoon et al., 2007). To better understand the quality of treatment integrity, there may be value in measuring fidelity of the proposed tutor training procedures to evaluate the effectiveness of specific tutor training protocols. Likewise, there may be value in measuring fidelity of the tutors' behavior during the implementation of students delivering PMIs to evaluate the effectiveness of specific procedures on tutees' outcomes. It is also informative to measure the PMI features implemented in the comparison condition, such as reported in Sáenz et al. (2005) and Vaughn et al. (2009).

When separated by PMI types, we reviewed 10 peer pairing studies and 4 collaborative/cooperative grouping studies. Direct comparisons between peer pairing and collaborative/cooperative grouping arrangements are limited because of nonoverlapping dependent variable constructs and measures. Notably, only Klingner and Vaughn (1996) directly compared reciprocal teaching plus cooperative grouping to reciprocal teaching plus tutoring, which resulted in improved comprehension outcomes for ELLs in both conditions, but significantly larger effects on a standardized measure that favored ELLs in the reciprocal teaching plus cooperative grouping condition. Although limited, this study should be replicated in other content areas and grade levels to explore whether this is a generalized outcome or one that is unique to this instructional situation. Furthermore, studies of direct comparisons between peer pairing and collaborative/cooperative grouping are needed to determine if one arrangement is more effective than the other.

Similar to our findings, Cole (2013) reported that PMIs, despite the type, result in positive outcomes for ELLs. Cole suggested that group size appears to be less important than the opportunity afforded to peers to actively engage with the content during PMIs. Cole concluded that "teacher-centered, monologic instruction creates an atmosphere of silence that removes an important opportunity to learn for ELLs" (p. 163). Allowing students to interact with their peers to discuss instructional objectives and learning material provides students with increased opportunities to learn (Santos, Darling-Hammond, & Cheuk, 2012). Other researchers also recommend that teachers provide ELLs with opportunities to work in pairs and in small groups to improve their literacy, English language development, and academic content (Baker et al., 2014; Gersten et al., 2007).

Although there is limited high-quality collaborative/cooperative grouping research available, BCIRC shows promise for improving ELLs' reading and language outcomes on statewide tests in Grades 2 and 3 and Peer Tutor Response Groups are associated with improved writing for ELLs in Grade 4 (Calderón et al., 1998; Prater & Bemudez, 1993). The WWC (2007a) found that BCIRC had potentially positive effects on reading achievement and English language development for ELLs in Grades 2 and 3. In the only collaborative/cooperative grouping study of high methodological quality, Klingner and Vaughn (1996) implemented CSR with ELLs and produced large effects on comprehension.

Additional, high-quality research is warranted to evaluate the effectiveness of collaborative/cooperative grouping PMIs with ELLs and corroborate the findings reported in this review.

Peer-Mediated Intervention Characteristics

There are various characteristics of PMIs, including intervention features, that were consistently identified across the studies in this review. These systematic implementation procedures included specific strategies for presenting content to peers, providing feedback to peers, and managing time and task features. Other common features of PMIs with ELLs across all studies included strategic heterogeneous grouping of students and reciprocal tutoring. Wexler et al. (2015) reported similar findings, suggesting that these are common PMI features. We found that less common features of PMIs with ELLs include the use of a reward system for motivation ($n = 4$ studies), and Greenwood et al. (2001) used a computer software tool to help teachers implement the PMI. Wexler et al. (2015) also reported that only one study in their PMI review included technology. More research is needed to evaluate whether motivational systems and technology increase the effectiveness and efficiency of PMIs with ELLs.

Grade Level

A majority of the studies were conducted in the elementary grades and no studies were conducted in high school. Implementation of PMIs with ELLs in the elementary grades could be a result of recommendations that teachers prioritize the development of formal or academic English during instruction as early as possible (Francis et al., 2006; Gersten et al., 2007). Students as young as of kindergarten age can learn peer-assisted learning techniques if the routines are simple and explicitly taught (McMaster et al., 2008). As ELLs reach upper elementary grades, they can learn how to provide feedback and assist each other in English language vocabulary development (Calderón et al., 1998). These instructional strategies are critical to improve academic outcomes for ELLs across Grades K–12 (Francis et al., 2006). Notably, a substantial gap in the available literature is the evaluation of PMIs with ELLs in high school.

Content Area

Considering the overlap of language and literacy instructional goals for ELLs, it is not surprising that in the majority of the studies researchers addressed areas of English language arts such as reading, spelling, or writing. Researchers targeted social studies and science in fewer studies, and in the studies we reviewed, researchers did not implement PMIs in mathematics. Thus, there is a clear need to address the effects of PMIs with ELLs in mathematics and other content areas such as science and social studies.

Language of Instruction

Researchers implemented PMIs with English-only instruction or a combination of English and Spanish instruction. Researchers did not report that other languages were spoken during the implementation of PMIs with ELLs. Several researchers reported that although English was the language of instruction,

materials were created in Spanish and students were encouraged to use their native language to help facilitate understanding of concepts. ELLs who received instruction in Spanish, to some degree, demonstrated improved outcomes in nearly all the academic areas represented in this review (i.e., phonemic awareness, fluency, vocabulary, and comprehension). Similarly, ELLs who received English-only PMI instruction demonstrated improved results on measures of phonemic awareness, fluency, and comprehension. It is possible, however, that ELLs spoke Spanish even though researchers reported that English was the official language of instruction. Additional research is needed to understand the extent to which the language of instruction influences ELLs' outcomes across a breadth of academic areas.

Language Proficiency

ELLs' scores on standardized measures that reflect language proficiency were reported inconsistently across studies. Moreover, in the studies in which language proficiency scores were reported, researchers employed various assessments (e.g., LAS, SOLOM, WMLS). To make language proficiency comparisons across studies, researchers must either use identical language proficiency tests or concurrent validity studies must be conducted to equate the various language proficiency scores. For example, McMaster et al. (2008) and Sáenz et al. (2005) are the only high-quality studies that included language proficiency scores. However, different language measures were used (i.e., SOLOM, WMLS) and no concurrent validity studies could be located to support the comparison of ELLs' language proficiency scores as a result of participating in PMIs. Thus, it is not clear to what extent ELLs across studies had the same or different levels of language proficiency. Given the role of English language proficiency in learning new skills in English (Cárdenas-Hagan, Carlson, & Pollard-Durodola, 2007; Goldenberg, 2008), quantitative data, such as scores on language proficiency measures, are needed to better understand the variability in ELLs' language proficiency and to determine the effectiveness of PMIs with ELLs who have different levels of language proficiency.

Group Size

Strategic matching was used in all peer pairing (dyads) studies and in two of the four collaborative/cooperative grouping (small groups) studies. In the other two studies, the authors divided up ELLs among all the collaborative/cooperative groups. Although we can assert that heterogeneous groupings are associated with positive, academic outcomes for ELLs, we do not know if heterogeneous groupings are critical to the success of PMIs. Additional research is needed to determine if homogeneous groupings with ELLs will result in outcomes that are similar to those observed with heterogeneous groupings.

Instructional Features and Training

Gersten et al. (2007) recommended that elementary teachers of ELLs should devote approximately 90 minutes a week to instructional activities in which dyads at different ability levels or different English language proficiencies work together on academic tasks in a structured fashion to practice and extend material already

taught. Researchers in all 14 studies in this review provided the recommended intensity within the week, regardless of the variability in weeks of instruction. However, in six studies, researchers employed multicomponent packages that included teacher-mediated instruction. Although the instructional package was implemented for at least 90 minutes per week, it was not possible to determine exactly how much time peers actually tutored or worked collaboratively within the PMI. Thus, in these studies, it was not possible to isolate the effects of the PMI from the other components implemented during the intervention. In the future, researchers should report the number of minutes peers engage in the PMI activity to determine the session length and duration associated with the largest academic gains for ELLs. This information is especially important to distinguish the effects of PMIs with ELLs separate of and in combination with teacher-mediated instruction.

Another feature of PMIs that is associated with improved academic outcomes includes instructional training prior to implementing PMIs. According to Stenhoff and Lignugaris/Kraft (2007), PMIs should include training before students begin the tutoring intervention. Researchers in the majority of studies included instructional training for ELLs and monitoring/management training for teachers. Based on the available, yet limited information, ELLs received training that included modeling, corrective feedback, and practicing PMI procedures. Training for teachers typically included classroom observations with feedback and coaching from research staff. Maheady, Harper, Mallette, and Winstanley (1991) demonstrated that teachers could learn the essential components of a tutoring program in as little as 90 minutes, and that once trained, they implemented the program without additional assistance. It is not clear how much instructional training is required for ELLs to sufficiently learn how to implement the PMI to produce positive outcomes or the necessary amount of teacher training with the most essential features to support ELLs' implementation of PMIs.

Summary of Implications and Future Research

Overall, there are eight studies that have high methodological quality ratings in which PMIs resulted in small to large effect sizes on academic outcomes for ELLs in kindergarten through Grade 8. In future studies, researchers should investigate PMIs that include standardized measures of academic skills, particularly in mathematics, to continuously increase our confidence in the effectiveness of PMIs with ELLs, especially for those students in Grades 9 to 12. More research on PMIs implemented with students with disabilities who are ELLs, in addition to comparisons among high-achieving, average-achieving, and low-achieving ELLs, is encouraged with more detailed information on ELLs' English language proficiency given its relationship to academic achievement (Goldenberg, 2008; Gottlieb, 2006). Future research should examine the effects of PMIs when implemented with students over longer periods of time. Another essential area of future research is to directly compare the effects of the PMI types, peer pairing versus collaborative/cooperative, on ELLs' academic outcomes. Last, given the adoption of the CCSS, it may be beneficial to evaluate the effects of PMIs on ELLs' listening, speaking, and language to assess the extent to which PMIs improve reading, writing, listening, speaking, and language across the disciplines as intended in the CCSS.

Note

This research was partially supported by Grant A27961 from the Office of Special Education Programs, U.S. Department of Education. The content is solely the responsibility of the authors and does not necessarily represent the official views of the Office of Special Education Programs.

References

References marked with an asterisk indicate studies included in this review.

Allor, J. H., Fuchs, D., & Mathes, P. G. (2001). Do students with and without lexical retrieval weakness respond differently to instruction? *Journal of Learning Disabilities*, *34*, 264–275. doi:10.1177/002221940103400306

*Almaguer, I. (2005). Effects of dyad reading instruction on the reading achievement of Hispanic third-grade English language learners. *Bilingual Research Journal*, *29*, 509–526. doi:10.1080/15235882.2005.10162849

August, D. L. (1987). Effects of peer tutoring on the second language acquisition of Mexican American children in elementary school. *TESOL Quarterly*, *21*, 717–736. doi:10.2307/3586991

Baker, S., Gersten, R., & Lee, D. S. (2002). A synthesis of empirical research on teaching mathematics to low-achieving students. *Elementary School Journal*, *103*, 51–73. doi:10.1086/499715

Baker, S., Lesaux, N., Jayanthi, M., Dimino, J., Proctor, C. P., Morris, J., . . . Newman-Gonchar, R. (2014). *Teaching academic content and literacy to English learners in elementary and middle school* (NCEE 2014-4012). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.

Ballard, W. S., Dalton, E. F., & Tighe, P. L. (1995). *IDEA Oral Language Proficiency Test in English* (5th ed.). Los Angeles, CA: Ballard & Tighe.

Bowman-Perrott, L. J., Greenwood, C. R., & Tapia, Y. (2007). The efficacy of CWPT used in secondary alternative school classrooms with small teacher/pupil ratios and students with emotional and behavioral disorders. *Education & Treatment of Children*, *30*, 65–87. doi:10.1353/etc.2007.0014

*Calderón, M., Hertz-Lazarowitz, R., & Slavin, R. (1998). Effects of Bilingual Cooperative Integrated Reading and Composition on students making the transition from Spanish to English reading. *Elementary School Journal*, *99*, 153–165. doi:10.1086/461920

*Calhoon, M. B., Al Otaiba, S., Cihak, D., King, A., & Avalos, A. (2007). Effects of a peer-mediated program on reading skill acquisition for two-way bilingual first-grade classrooms. *Learning Disability Quarterly*, *30*, 169–184. doi:10.2307/30035562

*Calhoon, M. B., Al Otaiba, S., Greenberg, D., King, A., & Avalos, A. (2006). Improving reading skills in predominantly Hispanic title 1 first-grade classrooms: The promise of peer-assisted learning strategies. *Learning Disabilities Research & Practice*, *21*, 261–272. doi:10.1111/j.1540-5826.2006.00222.x

Campbell, D. T., & Stanley, J. C. (1966). *Experimental and quasi-experimental designs for research*. Boston, MA: Houghton Mifflin.

Cárdenas-Hagan, E., Carlson, C. D., & Pollard-Durodola, S. D. (2007). The cross-linguistic transfer of early literacy skills: The role of initial L1and L2 skills and language of instruction. *Language, Speech, and Hearing Services in Schools*, *38*, 249–259. doi:10.1044/0161-1461(2007/026)

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.

Cole, M. (2013). Rompiendo el Silencio: Meta-analysis of effectiveness of peer-mediated learning at improving language outcomes for Ells. *Bilingual Research Journal*, *36*, 146–166. doi:10.1080/15235882.2013.814609

Cooper, H., Hedges, L. V., & Valentine, J. C. (Eds.). (2009). *The handbook of research synthesis and meta-analysis*. New York, NY: Russell Sage.

De Avila, E. A., & Duncan, S. E. (1984). *Language Assessment Scales*. Monterey, CA: CTB Macmillan McGraw-Hill.

DiCerbo, P. A., Anstrom, K. A., Baker, L. L., & Rivera, C. (2014). A review of the literature on teaching academic English to English language learners. *Review of Educational Research*, *84*, 446–482. doi:10.3102/0034654314532695

Echevarria, J., Short, D., & Powers, K. (2006). School reform and standards-based education: An instructional model for English language learners. *Journal of Educational Research*, *99*, 195–210. doi:10.3200/JOER.99.4.195-211

Francis, D., Rivera, M., Lesaux, N., Kieffer, M., & Rivera, H. (2006). *Practical guidelines for the education of English language learners: Research-based recommendations for instruction and academic interventions*. Portsmouth, NH: RMC Research Corporation, Center on Instruction.

Fuchs, D., Fuchs, L. S., & Burish, P. (2000). Peer-assisted learning strategies: An evidence-based practice to promote reading achievement. *Learning Disabilities Research & Practice*, *15*, 85–91. doi:10.1207/SLDRP1502_4

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. doi:10.3102/00028312034001174

Fuchs, L. S., Fuchs, D., & Karns, K. (2001). Enhancing kindergarteners' mathematical development: Effects of peer-assisted learning strategies. *Elementary School Journal*, *101*, 495–510. doi:10.1086/499684

Fuchs, L. S., Fuchs, D., Yazdian, L., & Powell, S. R. (2002). Enhancing first-grade children's mathematical development with peer-assisted learning strategies. *School Psychology Review*, *31*, 569–583.

Genesee, F., Lindholm-Leary, K., Saunders, W., & Si Christian, D. (2005). English language learners in U.S. schools: An overview of research findings. *Journal of Education for Students Placed at Risk*, *10*, 363–385. doi:10.1207/sl5327671esprl004_2

Gersten, R., & Baker, S. (2000). What we know about effective instructional practices for English language learners. *Exceptional Children*, *66*, 454–470. doi:10.1177/001440290006600402

Gersten, R., Baker, S. K., Shanahan, T., Linan-Thompson, S., Collins, P., & Scarcella, R. (2007). *Effective literacy and English language instruction for English learners in the elementary grades: A practice guide* (NCEE 2007-4011). Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education.

Gersten, R., Fuchs, L. S., Compton, D., Coyne, M., Greenwood, C., & Innocenti, M. S. (2005). Quality indicators for group experimental and quasi-experimental research in special education. *Exceptional Children*, *71*, 149–164. doi:10.1177/001440290507100202

Goldenberg, C. (2008). Improving achievement for English language learners. In S. B. Neuman (Ed.), *Educating the other America* (pp.139–162). Baltimore, MD: Brookes.

Gottlieb, M. (2006). *Assessing English language learners: Bridges from language proficiency to academic achievement*. New York, NY: Corwin Press.

*Greenwood, C. R., Arreaga-Mayer, C., Utley, C. A., Gavin, K. M., & Terry, B. J. (2001). Classwide peer tutoring learning management system: Applications within elementary-level English language learners. *Remedial and Special Education*, *22*, 34–47. doi:10.1177/074193250102200105

Greenwood, C. R., Carta, J. J., & Kamps, D. (1990). Teacher-mediated versus peer-mediated instruction: A review of educational advantages and disadvantages. In H. C. Foot, M. M. Morgan, & R. H. Shute (Eds.), *Children helping children* (pp. 177–205). New York, NY: John Wiley.

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

Harper, G. F., Mallette, B., Maheady, L., Parkes, V., & Moore, J. (1993). Retention and generalization of spelling words acquired using a peer-mediated instructional procedure by children with mild handicapping conditions. *Journal of Behavioral Education*, *3*, 25–38. doi:10.1007/BF00947143

Heron, T. E., & Harris, K. C. (2001). *The educational consultant: Helping professionals, parents, and students in inclusive settings* (4th ed.). Austin, TX: PRO-ED.

Heron, T. E., Welsch, R. G., & Goddard, Y. L. (2003). Applications of tutoring systems in specialized subject areas. *Remedial and Special Education*, *24*, 288–300. doi:10.1177/07419325030240050401

Horner, R. H., Carr, E., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single subject research to identify evidence-based practice in special education. *Exceptional Children*, *71*, 165–179. doi:10.1177/001440290507100203

Hudson, P., Lignugaris/Kraft, B., & Miller, T. L. (1993). Using content enhancements to improve the performance of adolescents with learning disabilities in content classes. *Learning Disabilities Research & Practice*, *8*, 106–127.

Kena, G., Musu-Gillette, L., Robinson, J., Wang, X., Rathbun, A., Zhang, J., . . . Dunlop Velez, E. (2015). *The condition of education 2015* (NCES 2015-144). Washington, DC: National Center for Education Statistics, U.S. Department of Education.

Kindler, A. L. (2002). *Survey of the states' limited English proficient students and available education programs and services, 2000-2001 summary report*. Washington, DC: National Clearinghouse for English Language Acquisition and Language Instruction Educational Programs.

*Klingner, J. K., & Vaughn, S. (1996). Reciprocal teaching of reading comprehension strategies for students with learning disabilities who use English as a second language. *Elementary School Journal*, *96*, 275–293. doi:10.1086/461828

*Klingner, J. K., & Vaughn, S. (2000). The helping behavior of fifth graders while using collaborative strategic reading during ESL content classes. *TESOL Quarterly*, *34*, 69–98. doi:10.2307/3588097

Klingner, J. K., Vaughn, S., & Schumm, J. S. (1998). Collaborative strategic reading during social studies in heterogeneous fourth-grade classrooms. *Elementary School Journal*, *99*, 3–22. doi:10.1086/461914

Lou, Y., Abrami, P. C., Spence, J. C., Poulsen, C., Chambers, B., & d'Apollonia, S. (1996). Within-class grouping: A meta-analysis. *Review of Educational Research*, *66*, 423–458. doi:10.3102/00346543066004423

MacArthur, C. A., Ferretti, R. P., & Okolo, C. M. (2002). On defending controversial viewpoints: Debates of sixth graders about the desirability of early 20th-century

American immigration. *Learning Disabilities Research & Practice*, *17*, 160–172. doi:10.1111/1540-5826.00042

*Madrid, L. D., Canas, M., & Ortega-Medina, M. (2007). Effects of team competition versus team cooperation in classwide peer tutoring. *Journal of Educational Research*, *100*, 155–160. doi:10.3200/JOER.100.3.155-160

*Madrid, L. D., Canas, M., & Watson, D. (2003). A comparative study of effective instructional strategies with low-achieving Hispanic bilingual children. *Research for Educational Reform, 8*, 25-–37.

Maheady, L., Harper, G. F., Mallette, B., & Winstanley, N. (1991). Training and implementation requirements associated with the use of a classwide peer tutoring system. *Education & Treatment of Children*, *14*, 177–198.

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. doi:10.2307/1510988

Mastropieri, M. A., Scruggs, T., Norland, J. J., Berkeley, S., McDuffie, K., Tornquist, E. H., & Conners, N. (2006). Differentiated curriculum enhancement in inclusive middle school science: Effects on classroom and high-stakes tests. *Journal of Special Education*, *40*, 130–137. doi:10.1177/00224669060400030101

Mastropieri, M. A., Scruggs, T. E., Spencer, V., & Fontana, J. (2003). Promoting success in high school world history: Peer tutoring versus guided notes. *Learning Disabilities Research & Practice*, *18*, 52–65. doi:10.1111/1540-5826.00057

*McMaster, K. L., Kung, S., Han, I., & Cao, M. (2008). Peer assisted learning strategies: A "tier 1" approach to promoting English learners' response to intervention. *Exceptional Children*, *74*, 194–214. doi:10.1177/001440290807400204

Mercer, C. D., & Mercer, A. R. (2001). *Teaching students with learning problems* (6th ed.). Upper Saddle River, NJ: Prentice Hall.

National Governors Association & Council of Chief State School Officers. (2010). *Common core state standards for English language arts and literacy in history/social studies, science, and technical subjects*. Washington, DC: Authors.

Okilwa, N. S. A., & Shelby, L. (2010). The effects of peer tutoring on academic performance of students with disabilities in grades 6 through 12: A synthesis of the literature. *Remedial and Special Education*, *31*, 450–463. doi:10.1177/0741932509355991

*Prater, D. L., & Bemudez, A. B. (1993). Using peer response groups with limited proficient writers. *Bilingual Research Journal*, *17*, 99–116. doi:10.1080/15235882.1993.10162650

Puzio, K., & Colby, G. T. (2013). Cooperative learning and literacy: A meta-analytic review. *Journal of Research on Educational Effectiveness*, *6*, 339–360. doi:10.1080/19345747.2013.775683

Ruiz-de-Velasco, J., Fix, M., & Clewell, B. C. (2000). *Overlooked and underserved: Immigrant students in U.S. secondary schools*. Washington, DC: Urban Institute.

*Sáenz, L. M., Fuchs, L. S., & Fuchs, D. (2005). Peer-assisted learning strategies for English language learners with learning disabilities. *Exceptional Children*, *71*, 231–247. doi:10.1177/001440290507100302

Santos, M., Darling-Hammond, L., & Cheuk, T. (2012). *Teacher development to support English language learners in the context of common core state standards*. Retrieved from http://ell.stanford.edu/publication/teacher-development-appropriate-support-ells

Scruggs, T. E., Mastropieri, M. A., & Marshak, L. (2012). Peer-mediated instruction in inclusive secondary social studies learning: Direct and indirect learning effects. *Learning Disabilities Research & Practice*, *27*, 12–20. doi:10.1111/j.1540-5826.2011.00346.x

Slavin, R. E. (1987). Cooperative learning and the cooperative school. *Educational Leadership*, *45*, 7–13.

Slavin, R. E., & Karweit, N. L. (1985). Effects of whole-class, ability-grouped, and individualized instruction on mathematics achievement. *American Educational Research Journal*, *22*, 351–367. doi:10.3102/00028312022003351

Snyder, T. D., & Dillow, S. A. (2009–2013). *Digest of education statistics 2009, 2010, 2012, 2013*. Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.

Stenhoff, D. M., & Lignugaris/Kraft, B. (2007). A review of the effects of peer tutoring on students with mild disabilities in secondary settings. *Exceptional Children*, *74*, 8–30. doi:10.1177/001440290707400101

Sullivan, P., Yeager, M., Chudowsky, N., Kober, N., O'Brien, E., & Gayler, K. (2005). *States try harder, but gaps persist: High school exit exams 2005*. Washington, DC: Center on Education Policy.

U.S. Department of Education. (2002–2013). *National Assessment of Educational Progress, 2002, 2003, 2005, 2007, 2009, 2011 and 2013 reading assessments*. Washington, DC: National Center for Education Statistics, Institute of Education Sciences, U.S. Department of Education.

*Vaughn, S., Martinez, L. R., Linan-Thompson, S., Reutebuch, C. K., Carlson, C. D., & Francis, D. J. (2009). Enhancing social studies vocabulary and comprehension for seventh-grade English language learners: Findings from two experimental studies. *Journal of Research on Educational Effectiveness*, *2*, 297–324. doi:10.1080/19345740903167018

Wexler, J., Reed, D. K., Pyle, N., Mitchell, M., & Barton, E. (2015). A synthesis of peer-mediated academic interventions for secondary struggling learners. *Journal of Learning Disabilities*, *48*, 451–470. doi:10.1177/0022219413504997

What Works Clearinghouse. (2007a). *Bilingual Cooperative Integrated Reading and Composition*. Retrieved from http://ies.ed.gov/ncee/wwc/interventionreport.aspx?sid=47

What Works Clearinghouse. (2007b). *Peer tutoring and response groups*. Retrieved from http://ies.ed.gov/ncee/wwc/interventionreport.aspx?sid=363

What Works Clearinghouse. (2010a). *Classwide peer tutoring*. Retrieved from http://ies.ed.gov/ncee/wwc/interventionreport.aspx?sid=83

What Works Clearinghouse. (2010b). *Peer-assisted learning strategies*. Retrieved from http://ies.ed.gov/ncee/wwc/interventionreport.aspx?sid=366

What Works Clearinghouse. (2014). *WWC procedures and standards handbook* (Version 3.0). Retrieved from http://ies.ed.gov/ncee/wwc/documentsum.aspx?sid=19

Woodcock, R. W. (1987). *Woodcock Reading Mastery Tests–Revised*. Circle Pines, MN: American Guidance Service.

Woodcock, R. W., & Muñoz-Sandoval, A. F. (1993). *Woodcock-Muñoz Language Survey comprehensive manual*. Chicago, IL: Riverside.

Authors

DANIEL PYLE, PhD, is an assistant professor in the Department of Teacher Education at Weber State University. 1351 Edvalson Street, Dept 1304, Ogden UT 84408-1304;

email: *danpyle@gmail.com*. His research interests include developing evidence-based instructional supports and services to improve academic and behavioral outcomes for students with disabilities accessing general education settings.

NICOLE PYLE, PhD, is an assistant professor in the School of Teacher Education and Leadership at Utah State University, 2805 Old Main Hill, Logan, UT 84322, USA; email: *nicole.pyle@usu.edu*. Her research interests include interventions for youth at risk, particularly in literacy, dropout prevention, and college readiness.

BENJAMIN LIGNUGARIS/KRAFT is a professor in the Department of Special Education and Rehabilitation at Utah State University, EDUC 313, 2865 Old Main Hill, Logan, UT 84322, USA; email: *ben.lig@usu.edu*. His areas of research include special education teacher preparation and effective instructional approaches for students with mild/moderate disabilities.

LILLIAN DURAN has a PhD in educational psychology from the University of Minnesota and is currently an associate professor in the Department of Special Education and Clinical Sciences at the University of Oregon, College of Education 1215, Eugene, OR 97403-1215, USA; email: *lduran@uoregon.edu*. Her research is focused on improving instructional and assessment practices with preschool-aged dual language learners. She is currently a co–principal investigator on an Institute of Education Sciences Goal 5 measurement grant to develop a Spanish version of the Individual Growth and Development Indicators, an early language and literacy general outcome measure for universal screening in preschool. She is also developing a Spanish–English version of Read It Again–PreK, a supplemental language and early literacy preschool curriculum.

JESSICA AKERS, PhD, BCBA, is a postdoctoral research associate at the University of Nebraska Medical Center, 985450 Nebraska Medical Center Omaha, NE 68198-5450, USA; email: *jessica.akers@unmc.edu*. Her research interests include identifying effective treatment packages for reducing challenging behavior and interventions for targeting social and play skills for children with autism.