The Effects of Peer-Assisted Learning Strategies on the Beginning Reading Skills of Young Children with Emotional or Behavioral Disorders

Katherine B. Falk and Joseph H. Wehby
Peabody College of Vanderbilt University

ABSTRACT: Students with emotional or behavioral disorders (E/BD) often exhibit reading problems that contribute to a progressive pattern of academic underachievement and school failure. However, limited research exists concerning effective reading interventions for students with E/BD. One reading program that has been validated in the literature with students who have learning disabilities (LD) is Peer-Assisted Learning Strategies (PALS), which consists of teacher-led and peer tutoring components. The purpose of this study was to determine the effectiveness of Kindergarten PALS (K-PALS) in increasing the beginning reading skills of kindergarten students identified as having E/BD. Results indicated that the peer tutoring phase of K-PALS led to increases in student scores on letter–sound correspondence and blending probes. Consistent with the literature on the efficacy of PALS with the LD population, these findings suggest that K-PALS is a promising approach in increasing the reading performance of students with E/BD who are at risk for reading failure.

Over the past several decades, researchers have documented a concurrent relationship between academic underachievement and emotional/behavioral disorders (E/BD) in school-aged youth (Coutinho, 1986; Epstein, Kinder, & Bursuck, 1989; Hinshaw, 1992b; Lambert, Hartsough, & Zimmerman, 1976). As a group, students with E/BD exhibit academic deficiencies of at least a year below grade level in most subject areas (Kauffman, 2001). Moreover, recent investigations reveal that slightly more than half of special education students identified as having problem behaviors may also be classified as having learning disabilities (LD; Glassberg, Hooper, & Mattison, 1999) or as having learning problems (Fessler, Rosenberg, & Rosenberg, 1991). Although the exact nature and directionality of the relationship remains equivocal, it is evident that academic and behavioral difficulties exist as highly correlated risk factors (Kauffman, 2001). The prognosis for students with behavioral and learning problems is often extremely poor; they experience school failure and drop out of school at much higher rates than any other disability group (Kortering & Blackorby, 1992; Rylance, 1997; Wagner, 1995; Wood & Cronin, 1999).

In spite of the acknowledged association between these two dimensions, there is a paucity of empirical research investigating academic interventions to implement with the E/BD population (Coleman & Vaughn, 2000; Gunter & Denny, 1998; Ruhl & Berlinghoff, 1992). The limited research that does exist has proven effective in the remediation of academic skills that have, in turn, yielded increases in academic performance as well as improvements in behavior (DuPaul, Ervin, Hook, & McGoey, 1998; Franca, Kerr, Reitz, & Lambert, 1990; Locke & Fuchs, 1995). More extensive research in the area of academic interventions is essential in an effort to circumvent the downward spiral that students with behavioral and learning problems often experience as they progress through school.

Academic Deficits of Students with E/BD

According to the federal definition of serious emotional disturbance under the Individuals with Disabilities Education Act (1990), poor academic achievement is distinguished as an identifying characteristic of those labeled with E/BD. In fact, students often are not classified as having E/BD unless they have also demonstrated a consistent pattern of academic and school failure (Forness, Kavale, & Lopez,

1993; Rock, Fessler, & Church, 1997). In a review outlining comorbidity trends of E/BD and academic underachievement, Hinshaw (1992a) purported that the two variables overlap at levels significantly above chance rates, with prevalence estimates varying from less than 10% to more than 50%. Discrepancies in prevalence figures result from a lack of agreement on how to precisely define *underachievement;* nonetheless, estimates clearly indicate that the prevalence of learning problems in students with E/BD is often reported as significantly higher than that in the population of students without disabilities (American Psychiatric Association, 1994).

Relationship Between Low Reading Achievement and E/BD

With respect to specific areas of academic underachievement, students with LD and learning problems most commonly exhibit severe deficits in the area of reading (Fessler et al., 1991). Given the overlapping characteristics between students with E/BD and those with LD, it is not surprising that many students with E/BD also manifest deficiencies in reading achievement (Maughan, Pickles, Hagell, Rutter, & Yule, 1996; McMichael, 1979; Richmond & Blagg, 1985; Stanton, Feehan, McGee, & Silva, 1990). Indeed, the issue of a possible link between E/BD and reading achievement, in particular, and the causal nature of such a relationship has generated much debate. Several researchers have contended that early deficiencies in reading pave the way for the subsequent development of behavioral problems (Fitzsimmons, Cheever, Leonard, & Macunovich, 1969; Williams & McGee, 1994). Conversely, others have disputed that reading deficits do not necessarily produce behavioral difficulties and that emotional or behavioral difficulties may predispose individuals to academic deficiency (Cornwall & Bawden, 1992; Patterson, DeBaryshe, & Ramsey, 1989). Adding to this debate is the fact that research has consistently reported a concomitant relationship between E/BD and language disorders, with the prevalence rates of their co-occurance ranging from moderate to high levels (Donahue, Cole, & Hartas, 1994; Kauffman, 2001; Rogers-Adkinson & Griffith, 1999; Sanger, Maag, & Shapiro, 1994). In turn, deficits in language and speech development have been identified as strong correlates of reading underachievement (Duane, 1983).

While the direction and nature of influence of the interaction between E/BD, language impairments, and reading difficulties remains indeterminate, it is clear that they often occur in conjunction with one another (Sampson, 1966). As a result, it is critical that academic interventions be established to address the specific reading needs of students with E/BD.

Peer Tutoring

One instructional method that has been shown to effect increases in academic achievement with students of varying ability levels is peer tutoring (Arreaga-Mayer, 1998; Greenwood & Delquadri, 1995; King-Sears & Bradley, 1995). Peer tutoring, also referred to as *peer-mediated instruction,* is best described as a didactic arrangement in which students are paired together to deliver teacher-selected instruction to one another (Maheady, Harper, & Sacca, 1988; Mathes & Fuchs, 1994). Research utilizing peer tutoring strategies has repeatedly documented considerable gains in achievement areas, including reading, for both the tutors and tutees. While research examining the effectiveness of peer tutoring on the achievement of students with E/BD is limited, what does exist imparts promising results (Cook, Scruggs, Mastropieri, & Casto, 1985; Durrer & McLaughlin, 1995; Franca et al., 1990; Osguthorpe & Scruggs, 1986; Scruggs, Mastropieri, & Richter, 1985; Shisler, Top, & Osguthorpe, 1986).

Effects of Tutoring on Behavior

In addition to academic benefit, some researchers advocate that peer tutoring may lead to behavioral improvements in students with disabilities (DuPaul et al., 1998; Franca et al., 1990). Results of one study (Maher, 1982) revealed that rates of absenteeism and disciplinary referrals significantly decreased in a group of adolescents with E/BD who tutored younger students with disabilities. In another study, fifth- and sixth-grade boys in a classroom for students with E/BD participated in a peer-mediated reading instruction program (Locke & Fuchs, 1995). During treatment, their average level of on-task performance increased by more than 30% while their mean level of positive interactions increased by more than 10%.

The findings of these studies suggest that peer tutoring may reap both academic and social benefits.

Peer-Assisted Learning Strategies

One version of classwide peer tutoring shown to successfully teach reading skills to students with LD and those who are performing at a low level is an instructional program known as Peer-Assisted Learning Strategies, or PALS (Fuchs, Fuchs, Mathes, & Simmons, 1997; Mathes, Grek, Howard, Babyak, & Allen, 1999). Within this tutoring program, higher-functioning readers are paired with their lower-performing classmates to deliver reading instruction several times a week. The students in the pair alternate between roles of coach and reader so that each one may benefit from both teaching and being taught. Students engage in a variety of reading activities designed to build on reading fluency and comprehension.

The efficacy of the PALS program has been evaluated in more than one setting and across grade levels. For instance, Fuchs and colleagues (1997) implemented the program with groups of elementary and middle school students consisting of low achievers with and without disabilities and average achievers. Pre- and postintervention testing was conducted with both experimental and control groups on a standardized reading achievement battery. Results of the posttests indicated that students involved in the PALS program made considerably higher gains than did the students in the No-PALS classrooms. While not every student participating in PALS made progress on reading measures, the program was demonstrated to be effective with most, particularly with those students in need of intensive remediation.

Similar results were found in an additional study that assessed the effectiveness of a PALS reading program designed specifically for first-grade students (Mathes et al., 1999). During the PALS program, students achieved dramatic gains in segmentation skills and reading connected text. Again, while First-Grade PALS did not effect such growth for about 15% to 20% of participating students, its success in substantially remediating reading deficits in most students deem it a powerful method in preventing continued reading failure for students with learning difficulties.

Fuchs and colleagues (1997) suggested that the success of PALS programs may be attributed to several factors. First, the PALS materials used by both teachers and students are concrete, structured, and easy to use. Teachers have explicit instructions on how to implement the program, and students are rewarded for various social and academic behaviors. In addition, the instructional advantages of tutoring conditions, as corroborated in other research, are in effect in the PALS peer tutoring component. Finally, teachers and students alike perceive PALS as an enjoyable and beneficial instructional program, which indicates that there may be a motivational component at work in the learning process.

Purpose of the Study

The prognosis for students who experience reading difficulties at a young age is especially grim. Results of one study indicated that students identified as poor readers in the first grade had still not acquired sufficient reading skills by the ninth grade (Francis, Shaywitz, Stuebing, Shaywitz, & Fletcher, 1996). Similarly, in a longitudinal study examining the literacy development of a sample of elementary-aged students, Juel (1988) determined that the probability that poor readers in the first grade would remain poor readers in the fourth grade was .88. In addition, she established that those students identified as poor readers possessed little phonemic awareness upon beginning the first grade. Therefore, the importance of training children in phonemic awareness (i.e., understanding the various sound properties of words) in kindergarten or preschool cannot be overstated. Two such phonological skills, sound blending and segmentation, have been identified as necessary and prerequisite skills in learning to read (Perfetti, Beck, Bell, & Hughes, 1987; Torneus, 1984).

However, it has been emphasized that phonemic awareness instruction alone is not sufficient for reading success. Juel also determined that poor decoding ability is a chief factor in preventing poor readers from increasing their reading achievement and from reading as much as students who are able to decode words effectively. While the ability to decode words is partially dependent on phonemic awareness, it must also stem from experience in print and explicit instruction in letter–sound correspondence (Juel, 1988; Juel, Griffith, & Gough, 1986).

Given the persistent academic deficiencies and patterns of school failure that students with E/BD and reading deficits often encounter, it is imperative that interventions be established to target deficits at the earliest age possible. Recently, researchers have formulated a PALS reading program to be used with students in kindergarten classrooms. This version of PALS has been designed to combine the foundational principles of PALS with strategies appropriate for children at this instructional level. In addition, the program offers balanced instruction in both phonological skills (i.e., blending and segmentation) and decoding skills (i.e., letter–sound correspondence). Due to the demonstrated success of the PALS reading program with low-performing students and students with LD, as well as the lack of empirical research detailing successful academic interventions with students with E/BD, it was the purpose of this study to determine the effectiveness of the peer tutoring component of Kindergarten PALS (K-PALS) in increasing the beginning reading skills of a group of kindergarten students identified as having E/BD.

Method

Participants

Six kindergarten students attending an urban elementary school in a southeastern metropolitan school district participated in the study. These students were enrolled full time in a self-contained classroom for students with E/BD. All of the students were male; they ranged in age from 5 to 6 years. Four of the 6 students had a primary disability label of speech/language disorder as defined by the state's Department of Education, while the other 2 students met state criteria for a primary diagnosis of emotional disturbance or health impaired/attention deficit hyperactivity disorder (ADHD). However, all 6 students were referred to special education services from preschool and early childhood programs due to teacher reports of high rates of problem behavior and deficits in social functioning. More specific student information and reasons for referral are presented in Table 1. Before implementation of the K-PALS program, the students were not participating in any formal reading instruction program. The K-PALS intervention was implemented in the classroom by a master's student in special education who had been trained in PALS procedures.

Measures

A pretest was individually administered to the students before implementation of the K-PALS program to evaluate their reading skills and ability levels. The assessment consisted of four different probes measuring student performance on letter-naming, letter–sound association, segmentation, and blending. Tests were scored according to the recorded number of correct responses in 1 minute. On the letter-naming probe, students were given a sheet of paper with each letter of the alphabet printed in both lowercase and uppercase forms and were asked to name as many letters as they could in the allotted time. Similarly, on the letter-sound probe, students were given a sheet with each letter of the alphabet presented in lowercase form and were asked to pronounce the sounds of the corresponding letters. Prior to testing on this probe, the examiner modeled and practiced four sample items with the student to clarify the difference between letter-naming and letter–sound association.

During the segmentation probe, students were asked to pronounce the individual sounds they could identify in two- and three-phoneme words read by the examiner. Again, the examiner practiced three sample items with the student using corrective feedback and an errorless learning technique to ensure that the student understood the testing procedure. If the student could not identify a single correct sound in four consecutive responses, testing was stopped.

Finally, during the blending probe, the examiner read the individual sounds in three-phoneme words and then asked the student to "put the sounds together and say the word." A practice trial with three sample items was conducted using the errorless learning technique at the beginning of testing. Correct responses were recorded only if the student said the correct word; no partial credit was awarded. If the student gave four consecutive incorrect responses, testing was stopped.

During all phases of the study, a weekly probe on the same four measures was administered individually to the participating students to monitor their progress. Testing was conducted in a separate part of the classroom at the same time of day and on the same day of the week throughout the entire intervention. Test

TABLE 1
Student Characteristics

Student	*Age*	*Primary Disability*	*Reason for Referral*
David	6	Language/speech	David came to the self-contained kindergarten classroom from a preschool special education program. Reports from this program cited David's frequent aggressive and destructive incidents toward peers, adults, and materials in the classroom. The teacher indicated that David had trouble with transitions and that he needed continuous verbal cuing and physical assists to remain in group activities and lessons. Other behaviors noted were kicking, pushing, getting angry very quickly, and running off from teachers.
Brandon	6	Language/speech	Brandon came to the kindergarten classroom from an early childhood center. Reports indicated that Brandon frequently displayed inappropriate behaviors that interfered with his ability to learn, such as noncompliance, refusal to work, hitting, kicking, crying, and "shutting down."
Sam	6	Other health impaired/ADHD	Information not available.
Jamarie	6	Emotionally disturbed	Jamarie was referred to the self-contained classroom in the fall of his kindergarten year when he became eligible for special education with a certification of emotional disturbance and language/speech impairment. Behaviors noted for Jamarie in assessment reports included tantrums, destruction of property, running from the teacher, use of profanity, sleeping in class, banging his head on the wall, and a persistent negative attitude.
Tommy	5	Language/speech	Tommy was referred to the self-contained class from a preschool inclusion program. Reports documented a list of problem behaviors including physical aggression toward teachers and assistants, kicking, pulling hair, running from class, refusal to participate in activities, explosive tantrums, frequently telling others he doesn't like them, screaming, pouting, "shutting down," destruction, throwing objects, and making inappropriate comments during group time. Tommy was also described as having a low attention span and frequently requiring physical assists during transitions.
Reggie	6	Language/speech	Reggie came to the classroom from an early childhood center. He was reported as having deficits in attention/concentration, organization, self-control, and communication. Other noted problems included disrespect to adults and both physical and verbal aggression.

items were randomized from week to week to account for performance gains that might result from the memorization of item sequence.

Research Design

A multiple-baseline design across tutoring pairs was employed in this study. Since the students were not receiving any formal reading instruction at the start of the K-PALS condition, the introduction of any kind of intervention would be likely to produce gains in achievement measures. To account for this, the prebaseline phase consisted only of teacher-directed sound play lessons in order to achieve a stable reading time for the students. The baseline condition began at the beginning of the fourth week and incorporated both sound play activities and teacher-directed decoding lessons. Finally, the peer tutoring condition was introduced sequentially across the three tutoring pairs. Tutoring sessions were instituted for each student pair once they had demonstrated stability in performance on the letter-sound probes across several data points. Tutoring sessions for the student pairs were implemented at staggered intervals for the remainder of the intervention phase.

K-PALS Procedures

The K-PALS intervention was conducted with the entire class three times a week for an 11-week period. The intervention included both teacher-directed activities and a peer tutoring component; teacher-led activities were introduced initially for all students while peer tutoring activities were introduced sequentially across student pairs. Implementation procedures were outlined in the K-PALS teacher's manual, which was supplemented with materials and scripted lessons to use for each component of the program. The K-PALS program consisted of two types of activities: sound play and decoding.

Sound Play Activities

During the sound play activities, students practiced four different skills targeted to strengthen their phonological awareness: sound identity, rhyming, blending, and segmenting. Each sound play activity was presented in game format and lasted for about 10 minutes. In this study, all sound play lessons consisted solely of a teacher-led presentation of each activity.

In the sound identity activities, students were asked to identify which pictures on the page had the same beginning or ending sound. For example, the teacher showed the students a picture of a snake next to a row of three pictures and then asked, "What starts like snake? Tomato, sun, or mitt?" Similarly, in the rhyming activities, students chose the picture whose name rhymed with that of two given pictures (e.g., "What rhymes with cat and mat? Bat or carrot?"). Finally, students practiced both segmenting and blending skills in activities in which they either clapped out the syllables to words or segmented/blended individual phonemes in words using sound boxes.

Decoding Activities

The decoding activities were designed to help children build on their reading fluency with respect to letter–sound correspondence. Decoding lessons lasted for 10 to 15 minutes and consisted of two activities, the "What Sound?" activity and the "What Word?" activity. In the "What Sound?" activity, the teacher explicitly taught the students the sounds that individual letters make. A new sound was presented almost every other lesson. In each lesson, the readers practiced previously learned sounds along with the new sound if one was introduced. The teacher pointed to the letter and asked, "What sound?" The student responded, and, if an incorrect response was given, the teacher said, "Stop. That sound is . . . What sound? Good. Read that line again." Stars were interspersed among the rows of letters to prompt the teacher to praise the readers.

The "What Word?" exercise consisted of several parts. In "Sing It and Read It," students practiced decoding simple words by "singing them" (i.e., reading the words slowly without stopping between sounds) and then by reading them more quickly. Students were also taught to recognize common sight words, which they practiced reading throughout the lessons. The teacher pointed to the sight word and asked, "What word?" The student then responded, and, if an incorrect answer was given, the same correction procedures used in the "What Sound?" activity were employed.

Teacher-Directed Activities

Teacher-directed activities were conducted three times a week at the beginning of the school day. During the teacher-directed activities, the students sat on a mat at the front of the

classroom and faced the teacher as she taught the lesson. Depending on what activities were included, the teacher-directed activities lasted from 10 to 25 minutes each day, for a total range of 30 to 75 minutes a week for these activities. Students were given numerous opportunities to respond and practice the various skills. If an incorrect answer was given, the teacher modeled the appropriate correction procedure, which remained consistent throughout the activity and was used by the students in their peer tutoring sessions. Students were also frequently called on to be the teacher, or "coach," for the rest of the class to practice leading the activity and using the correction procedures.

Peer Tutoring Sessions

After the teacher-directed activities were completed, the teacher and the assigned student pairs moved to a mat on the other side of the room to begin the peer tutoring sessions. During the tutoring sessions, each student pair practiced the decoding activities that corresponded with the teacher-directed lesson for that day. The students alternated between roles of coach and reader, with the stronger reader always beginning the session as the coach. In the coaching role, the student acted as the teacher and prompted the reader for responses through the various activities. When the students completed an activity one time through, they switched roles and practiced the activity again. Each tutoring pair was given a weekly point sheet and could receive points for following PALS procedures and rules, working cooperatively, and completing the decoding activities. An initial training session for each tutoring pair lasted about 45 minutes, while subsequent tutoring sessions were conducted for 20 to 25 minutes.

Peer Tutoring Assignments

Tutoring pairs were assigned so that there was a higher-functioning student placed with a lower-functioning student. In matching pairs, the 6 students were first ranked according to their average scores on the first four letter-naming probes administered during the pre-baseline and baseline phases. The ranked list of the 6 students was then split in half. Next, the students were matched on their corresponding rankings in each half so that the top-ranked students in each half were paired together, the second-ranked students in each half were paired together, and both third-ranked students were paired together. A total of three student pairs were assigned to participate in the peer tutoring component of the K-PALS intervention.

Fidelity Procedures

Trained PALS personnel conducted two separate observations of K-PALS teacher-directed lessons in the classroom to assess intervention fidelity. The observer watched for specific teacher behaviors during both sound play lessons and decoding lessons; these were then recorded on a checklist and calculated to receive a percentage measure for accuracy of implementation. Teacher behaviors included on the checklist were scored as having occurred, not occurred, or as not applicable. At the completion of the lesson, the observer offered feedback and reviewed the checklist with the teacher.

In addition, assessment fidelity was conducted on two occasions. The testing procedures employed by the examiner, as well as the oral responses given by the student, were tape recorded. Personnel trained in PALS then listened to the tapes to determine whether appropriate testing procedures were implemented consistently and to calculate testing scores based on an evaluation of student responses. These scores were then compared with the original examiner's scores to determine the fidelity of the data collection process. Any procedural inconsistencies and differences in scoring were manually recorded by the PALS personnel.

Because there were so few student pairs involved in the peer tutoring sessions, the PALS teacher was able to consistently monitor the use of correct tutoring procedures on a daily basis. Any errors in implementation were immediately addressed in the tutoring sessions and monitored further to ensure that the students corrected the errors appropriately.

Results

Fidelity Procedures

Results of the first intervention fidelity check revealed that the decoding activities were implemented with 89% accuracy and the "Guess My Word" sound play activity was implemented with 92% accuracy. The second

fidelity check, conducted exactly 1 week later, revealed that the decoding activities were implemented with 100% accuracy and the "Guess My Word" activity was implemented with 91% accuracy. Results of the two assessment fidelity checks revealed that the testing was implemented and scores were recorded with 100% accuracy on both occasions.

Letter-Sound Scores for Peer Tutors

Figure 1 shows the number of letter-sounds correctly pronounced in 1 minute for the students in the three peer tutoring pairs. The first pair to participate in the peer tutoring component consisted of David and Brandon. During the teacher-directed sound play and decoding activities, David's scores on the letter-sound probes ranged from 5 to 9. After the introduction of peer tutoring, David's scores ranged from 9 to 17, with only 1 overlapping data point. Brandon's scores during the teacher-directed phase ranged from 1 to 3, while during the peer tutoring phase his scores ranged from 4 to 18, with no overlapping data points.

After 3 weeks of the tutoring phase for the first pair, peer tutoring was then introduced to the second pair, Sam and Jamarie. During the teacher-directed phase, Sam's letter-sound scores were relatively stable, ranging from 1 to 5. However, with the introduction of peer tutoring, his scores demonstrated an immediate jump; during this phase they ranged from 7 to 11, with no overlapping data points. On the other hand, Jamarie's scores during the peer tutoring phase were more varied. During the teacher-directed phase, Jamarie's scores ranged from 0 to 3. After peer tutoring was introduced, his scores ranged from 2 to 9, with 1 overlapping data point.

Finally, after 4 weeks of the tutoring phase for the second pair, peer tutoring was introduced to the third pair of students, Tommy and Reggie. During the extended baseline phase, Tommy's scores ranged from 1 to 11. After the introduction of peer tutoring, his scores ranged from 11 to 12, with 1 overlapping data point. Reggie's scores during the teacher-directed phase ranged from 0 to 7, while during the peer tutoring phase his scores ranged from 7 to 14, with 1 overlapping data point.

Segmentation Scores for Peer Tutors

Analysis of the segmentation scores for the peer tutors revealed mixed results in student performance. Figure 2 shows the number of sounds in words correctly identified and pronounced in 1 minute. During both the teacher-directed and peer tutoring phases, David's scores ranged from 1 to 9. On the other hand, Brandon did not score above 0 on segmentation measures during the teacher-directed phase. However, during the peer tutoring phase, his scores ranged from 0 to 4, with only 1 overlapping data point.

In the second tutoring pair, Sam's segmentation scores ranged from 7 to 21 during the teacher-directed phase. After the introduction of peer tutoring, his scores decreased in range from 6 to 12. Jamarie's scores demonstrated more stability across the intervention phases. During the teacher-directed phase, his scores ranged from 0 to 2, while during the tutoring phase his scores ranged from 0 to 3, with 4 overlapping data points.

The segmentation scores for the third tutoring pair were inconsistent. During the teacher-directed phase, Tommy's scores ranged from 0 to 6. After the introduction of peer tutoring, his scores ranged from 0 to 3. Similarly, Reggie's scores ranged from 0 to 7 during the teacher-directed phase and from 0 to 3 during the peer tutoring phase.

Blending Scores for Peer Tutors

Figure 3 shows the number of words correctly blended from the segmented sounds in 1 minute. In the first peer tutoring pair, David did not score above 0 during the teacher-directed phase. After the introduction of peer tutoring, his blending scores ranged from 0 to 4, with 1 overlapping data point. Brandon also did not score above 0 during the teacher-directed phase; however, during the peer tutoring phase, his scores ranged from 0 to 1, with only 1 overlapping data point.

In the second tutoring pair, Sam's blending scores ranged from 5 to 13 during the teacher-directed phase. Once the peer tutoring phase began, his scores demonstrated a marked increase, ranging from 16 to 18. Jamarie's scores ranged from 0 to 3 during the teacher-directed phase and from 0 to 5 during the tutoring phase, with only 2 nonoverlapping data points.

Finally, in the third tutoring pair, Tommy's blending scores ranged from 0 to 14 during the teacher-directed phase. After the introduction of peer tutoring, his scores decreased in range from 1 to 10. Reggie's scores ranged from 0 to

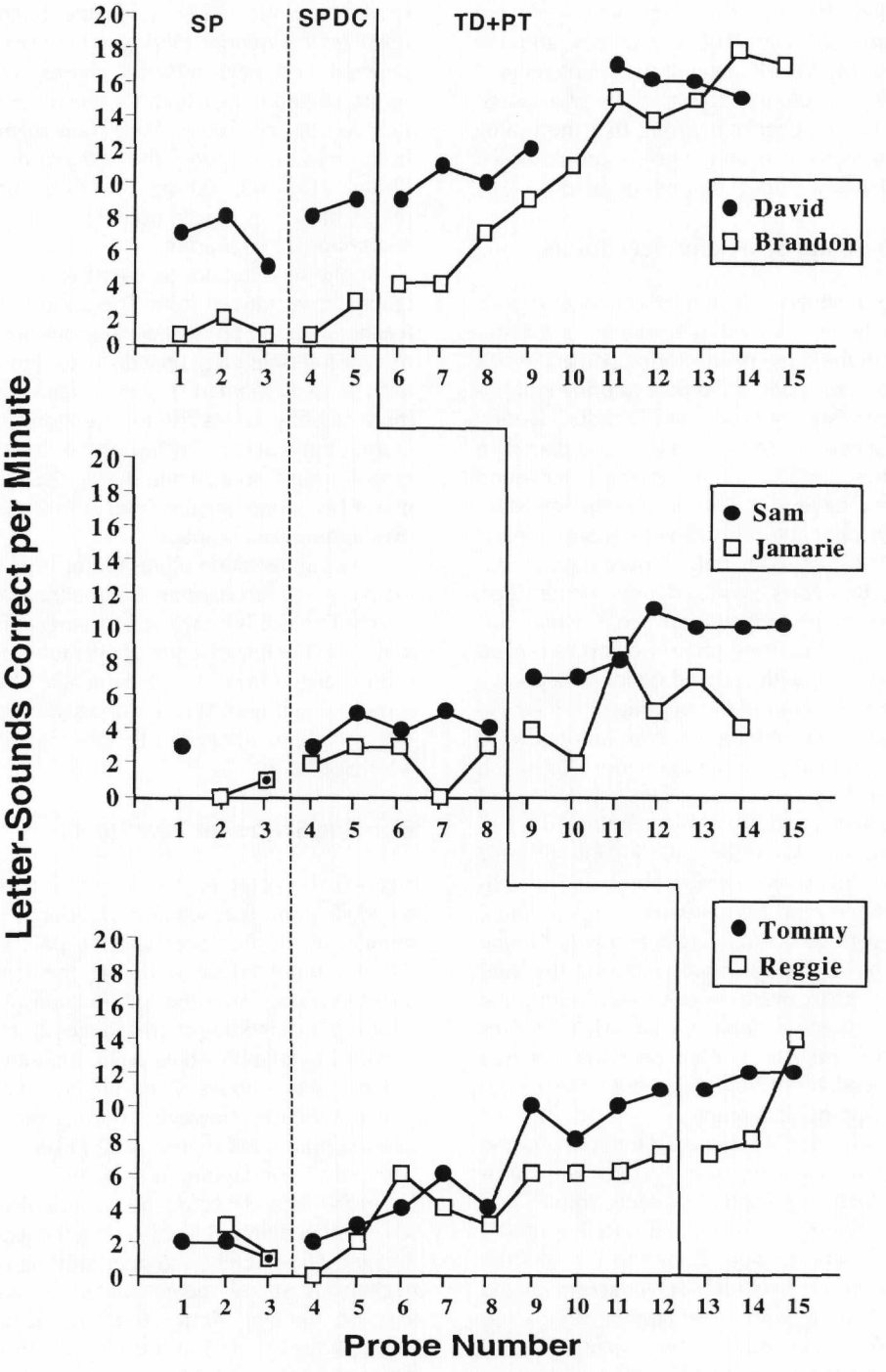

FIGURE 1. Results of letter-sounds correct in 1 minute during teacher-directed sound play (SP), teacher-directed sound play and decoding (SPDC), and teacher-directed sound play and decoding plus peer tutoring (TD+PT).

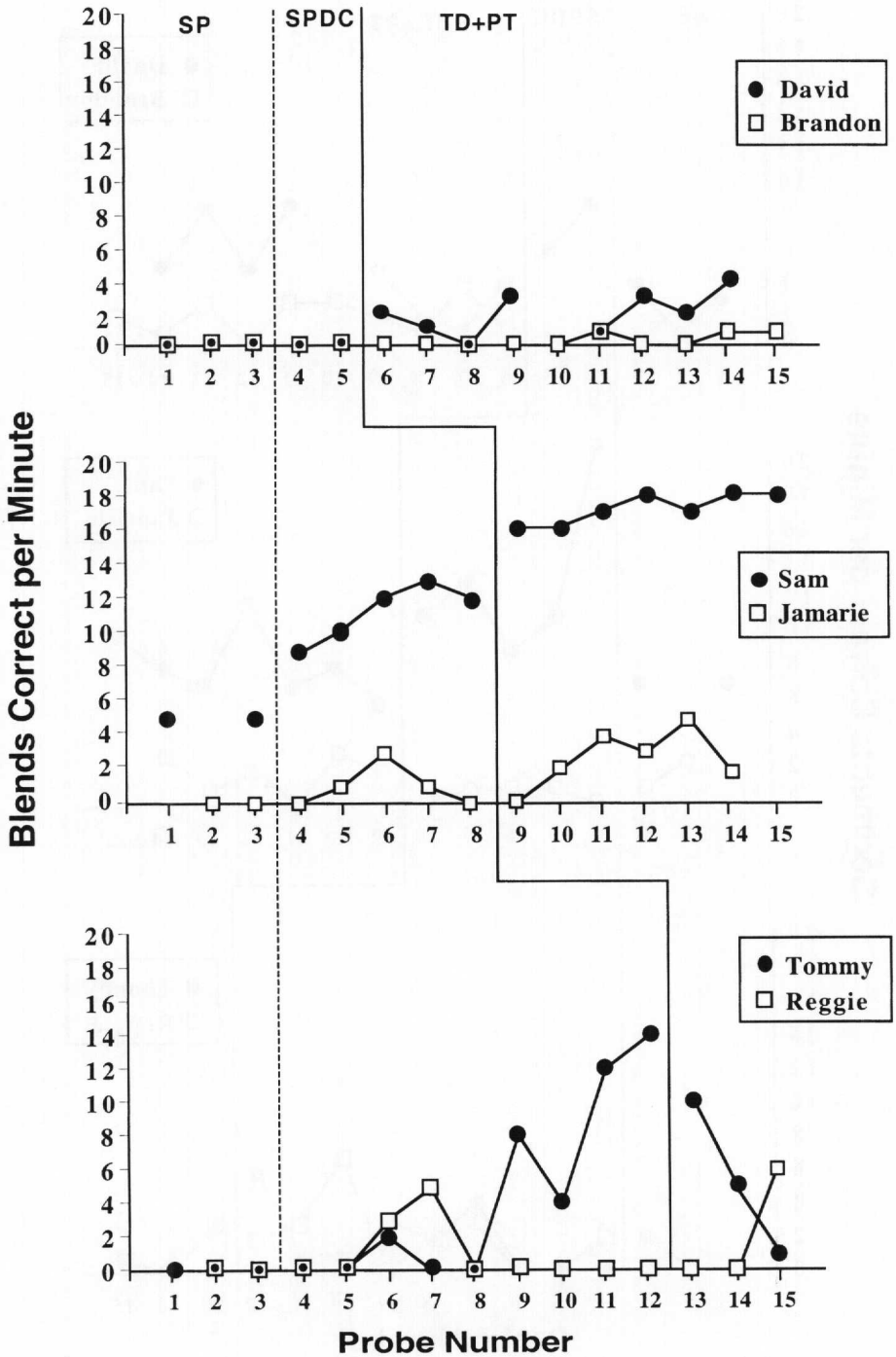

FIGURE 2. Results of blended words correct in 1 minute during teacher-directed sound play (SP), teacher-directed sound play and decoding (SPDC), and teacher-directed sound play and decoding plus peer tutoring (TD+PT).

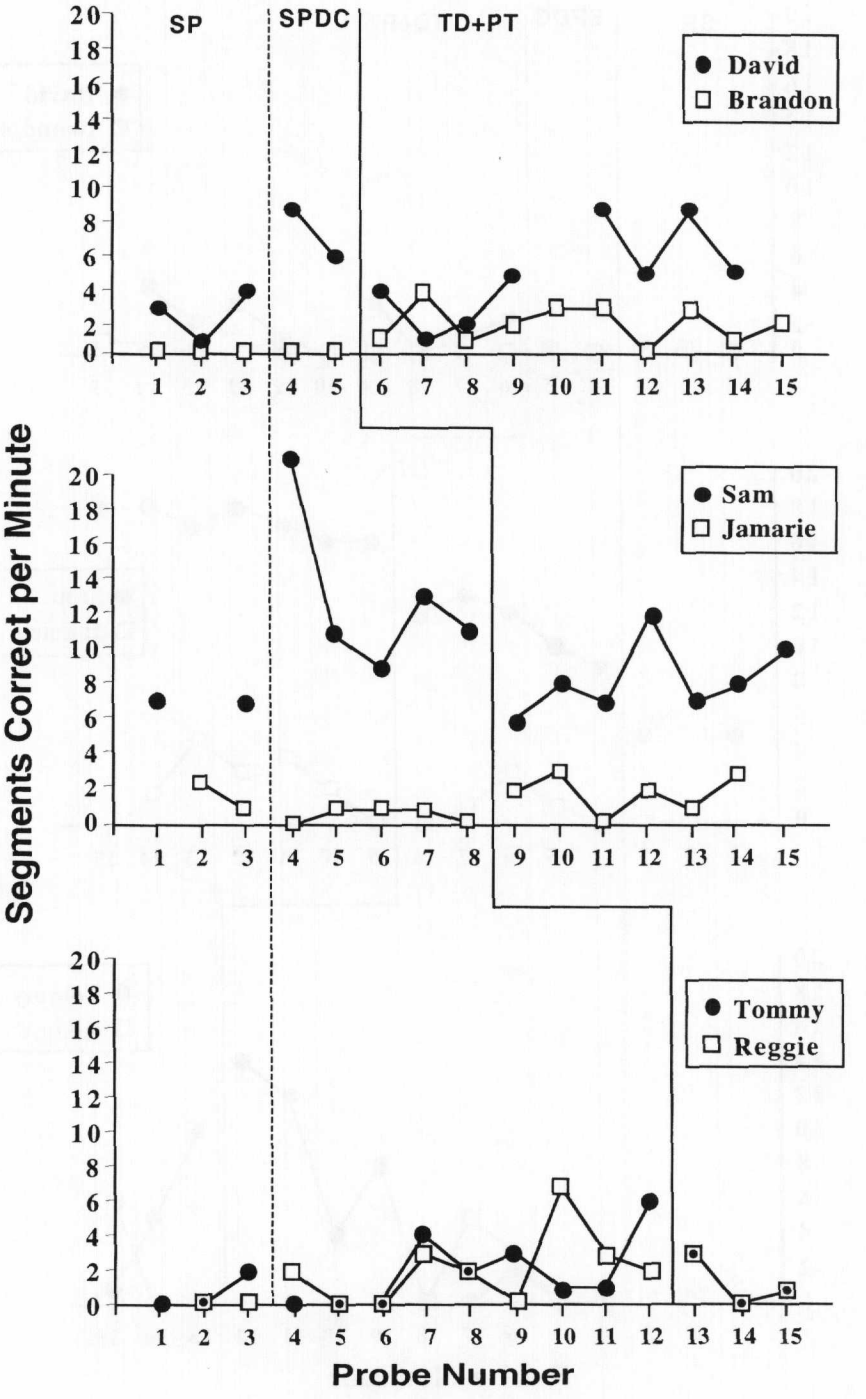

FIGURE 3. Results of segments correct in 1 minute during teacher-directed sound play (SP), teacher-directed sound play and decoding (SPDC), and teacher-directed sound play and decoding plus peer tutoring (TD+PT).

TABLE 2
Total Number of Correct Responses for Pretest/Posttest Probes

	Letter-Sounds		*Blending*		*Segmenting*	
Student	***Pretest***	***Posttest***	***Pretest***	***Posttest***	***Pretest***	***Posttest***
David	6	21	1	3	11	9
Brandon	A[1]	16	1	0	0	0
Sam	0	14	6	18	8	7
Jamarie	1	7	0	2	0	0
Tommy	1	12	1	8	0	15
Reggie	0	10	0	4	0	0

[1]Student was absent.

5 during the teacher-directed phase and from 0 to 6 during the tutoring phase.

Pretest/Posttest Data

A comparison between pretest and posttest data revealed marked increases in letter-sound identification and blending skills for students participating in both teacher-led and peer tutoring activities in K-PALS (see Table 2). The only student who demonstrated growth from pretest to posttest on segmentation probes was Tommy. The remaining students' scores either remained stable on this measure or decreased slightly over time. Because the end of the intervention coincided with the end of the school year, no additional maintenance data were collected.

Discussion

Although students with E/BD are often plagued with difficulties in learning to read, research identifying effective academic interventions with this population is remarkably limited. Given the reading failure that students with E/BD often experience, it was the purpose of this study to evaluate the effectiveness of Peer-Assisted Learning Strategies, a program validated in the literature on learning disabilities, with kindergarten students with E/BD.

Results of this investigation indicated that the peer tutoring component of K-PALS was effective in increasing student performance on measures of letter-sound identification and blending. Specifically, increases in letter-sound scores were noted for David, Brandon, Sam, and Reggie during the tutoring phase. On the other hand, Jamarie's scores were more varied; his performance may have been influenced by his difficulties in staying on task and cooperating with his tutoring partner. The increase in his letter-sound performance at the 11th week was likely a result of a behavioral contingency that was individualized for him to encourage more appropriate behaviors during the tutoring session. Because Jamarie had demonstrated noncompliant and off-task behaviors that interfered with his participation in the tutoring sessions, the teacher established a behavioral contract with him that enabled him to receive a tangible reinforcer if he was able to follow PALS rules and procedures and receive no more than one verbal warning during the tutoring sessions. In spite of the variation of his scores, the fact that 5 of his 6 data points during the tutoring phase were nonoverlapping indicates that the peer tutoring intervention effected increases in his reading performance. Increases in letter-sound identification were also noted for Tommy during the tutoring phase, although his growth on this measure did not exceed what would otherwise result from his continued participation in the teacher-directed activities alone.

Analysis of the data also indicated that the peer tutoring intervention was effective in increasing the blending skills for 5 of the 6 participating students. Although performance on blending probes was less consistent, more nonoverlapping data points were noted across students on this measure following the implementation of the peer tutoring intervention. However, a decrease in blending scores was observed for Tommy once the peer tutoring intervention was introduced. Testing probes on this measure were reexamined to determine whether the difficulty level had increased for the last three probes, yet no noticeable differences were found. It is possible that Tommy's

scores were influenced by factors that were not identified or measured in this investigation. As a result, future research should incorporate broader measures to better evaluate the impact of setting events or other variables that might impact student performance.

In comparison, the scores on the segmentation probes were especially inconsistent. The peer tutoring intervention did not effect growth on this particular measure for 5 of the 6 students. Moreover, for David, Jamarie, Tommy, and Reggie, segmenting scores actually decreased during the peer tutoring phase. The only student who appeared to make some gains on this measure was Brandon. While previous research (Mathes et al., 1999) had indicated significant growth in segmentation skills for students following the implementation of PALS, the results of our study did not corroborate this finding.

The variability in segmentation scores may be explained in several ways. First, the instruction in letter-sound identification and blending was more explicit than the segmentation instruction during the teacher-led activities. In a study investigating the impact of a first-grade PALS program on the reading achievement of low-performing readers (Mathes et al.), the segmentation activities involved more explicit instruction and practice time during peer tutoring sessions. Although segmenting skills were practiced during the sound play activities in this study, the instructional activities were abstract in nature and required the students to make a less explicit connection between letters and sounds. It is probable that segmentation is a higher-order reading skill that developmentally follows the acquisition of more basic and prerequisite reading skills that these students had not fully attained.

Second, the peer tutoring lessons did not include any segmentation activities; therefore, students received substantially more practice in letter-sound and blending activities. As a result, the effects of this repeated practice are reflected in the increased performance on the corresponding probes. Finally, some research has suggested that particular speech impairments may result from phonological impairments characterized by an inability to segment syllables into individual phonemes (Bird, Bishop, & Freeman, 1995). Since four of the participating students were identified as having speech/language impairments, this would provide a plausible explanation for the inconsistency of scores on segmentation probes.

Limitations of the Study

Analysis of the data revealed that the K-PALS intervention was successful in increasing the beginning reading skills of each of the participants. Although these findings demonstrate the effectiveness of K-PALS in addressing the reading deficits of students with E/BD, this investigation was limited in several ways. First, it was not known at the implementation of the intervention what, if any, prereading instruction the students had received. Pretest data revealed that the students were performing at a variety of ability levels, yet it is difficult to determine what influence prior instruction might have had on student performance throughout this intervention.

Second, the extent to which speech/language deficits impacted the students' ability to participate in the K-PALS program is not exactly clear. Several of the students had difficulties coaching other students and following the routine procedures of the K-PALS program. It is possible that deficits in either receptive or expressive language abilities may have hindered the students' ability to process and understand oral directions or to verbalize directions to other students. In the same respect, behavioral difficulties, such as off-task and noncompliant behaviors, may have also impacted the students' ability to participate in the program. It may be helpful to provide instruction to particular students in prerequisite academic and social skills in order to increase the applicability of the reading program as a classwide model at the kindergarten level.

Third, because the second intervention phase of teacher decoding and sound play included only 2 data points for the first peer tutoring pair, it is difficult to establish whether increases in performance at the beginning of the peer tutoring phase continued to be effected by the addition of the teacher decoding component. The differential effects of both teacher decoding and peer tutoring could have been ascertained more clearly if the teacher decoding intervention phase had been extended to allow for more stability across measures. However, when the two teacher-directed intervention phases are combined, it is clear that there was a stable trend in student performance before the introduction of peer tutoring and that peer tutoring effected increases in letter-sound scores. In addition, there appeared to be some improvement in the sound play

and decoding intervention phase for the last two tutoring pairs; however, a visual inspection of the data and calculation of the slopes for the last 3 data points before the implementation of peer tutoring revealed that the acceleration of trends for each student was near zero.

It also appears from Figure 3 that there was an increase in the blending data for Tommy (third pair) when the peer tutoring intervention was implemented for the second pair of students (i.e., Sam and Jamarie). This finding suggests the possibility of some interdependence between the two pairs. However, this is difficult to explain given that the peer tutoring sessions occurred in a separate part of the classroom and that no other reading instruction (other than that described) was being provided. Since the students were receiving reading instruction on blending during teacher-directed instruction, it is possible that increases in blending were a result of this instruction and not the result of dependence among pairs. Nevertheless, this finding may limit the evaluation of the intervention.

Finally, the K-PALS reading program was implemented in the classroom only three times a week. It has been suggested that extended interventions in phonological awareness may effect higher gains for children who are typically resistant to treatment (O'Connor, Notari-Syverson, & Vadasy, 1996). Given the increases in reading achievement that were noted during the duration of this investigation, it is possible that the intervention might have an even stronger impact if it were incorporated into the classroom's daily instructional schedule.

Implications for Future Research

The findings and limitations of this study lead to several implications for future research. First, although the study demonstrated that the students involved in both the teacher-directed and peer tutoring components of K-PALS increased their reading achievement, it did not examine whether the reading skills they acquired were sufficient for them to perform on the same level as their typically developing peers. A longitudinal investigation evaluating the students' reading achievement in the first grade as compared to their typical peers would better determine whether the K-PALS program equipped the students with the reading readiness skills necessary to prevent further reading failure.

Second, previous research has demonstrated that increases in academic achievement may lead to improvements in behavior. While this study did not specifically examine this issue, it would be beneficial to investigate the effects of K-PALS on classroom behavior and peer relationships to better understand the relationship between academic- and behavior-related variables. We are currently developing such research to investigate these specific issues more closely. Likewise, longitudinal research could identify whether children who are at risk for the development of E/BD are less likely to develop such problems if their reading deficits are addressed at an early age.

Third, given the language/speech impairments and behavioral issues of several of the students, future research should assess and identify the characteristics of nonresponders and should consider what modifications in the K-PALS program would allow these students to benefit more from the reading instruction.

Finally, while this investigation demonstrated that the K-PALS program increased the reading achievement of kindergarten students identified as having E/BD, the literature identifying effective academic interventions with this population remains scarce. Research in this area should be a priority in order to address the needs of students at such risk for school failure.

References

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: Author.

Arreaga-Mayer, C. (1998). Increasing active student responding and improving academic performance through classwide peer tutoring. *Intervention in School and Clinic, 34*(2), 89–94.

Bird, J., Bishop, D. V. M., & Freeman, N. H. (1995). Phonological awareness and literacy development in children with expressive phonological impairments. *Journal of Speech and Hearing Research, 38,* 446–462.

Coleman, M., & Vaughn, S. (2000). Reading interventions for students with emotional/behavioral disorders. *Behavioral Disorders, 25,* 93–104.

Cook, S. B., Scruggs, T. E., Mastropieri, M. A. & Casto, G. C. (1985-1986). Handicapped students as tutors. *The Journal of Special Education, 19,* 155–164.

Cornwall, A. & Bawden, H. N. (1992). Reading disabilities and aggression: A critical review. *Journal of Learning Disabilities, 25*(5), 281–288.

Coutinho, M. J. (1986). Reading achievement of students identified as behaviorally disordered at the secondary level. *Behavioral Disorders, 11,* 200–207.

Donahue, M., Cole, D., & Hartas, D. (1994). Links between language and emotional/behavioral disorders. *Education and Treatment of Children, 17,* 244–254.

Donahue, M. L., Hartas, D., & Cole, D. (1999). Research on interactions among oral language and emotional/behavioral disorders. In D. Rogers-Adkinson & P. Griffith (Eds.), *Communication disorders and children with psychiatric and behavioral disorders.* San Diego, CA: Singular.

Duane, D. D. (1983). Neurobiological correlates of reading disorders. *Journal of Educational Research, 77,* 5–15.

DuPaul, G. J., Ervin, R. A., Hook, C. L., & McGoey, K. E. (1998). Peer tutoring for children with attention deficit hyperactivity disorder: Effects on classroom behavior and academic performance. *Journal of Applied Behavioral Analysis, 31,* 579–592.

Durrer, B. & McLaughlin, T. F. (1995). The use of peer tutoring interventions involving students with behaviour disorders. *B.C. Journal of Special Education, 19*(1), 20–27.

Epstein, M. H., Kinder, D., & Bursuck, B. (1989) The academic status of adolescents with behavioral disorders. *Behavioral Disorders, 14,* 157–165.

Fessler, M. A., Rosenberg, M. S., & Rosenberg, L. A. (1991). Concomitant learning disabilities and learning problems among students with behavioral/emotional disorders. *Behavioral Disorders, 16,* 97–106.

Fitzsimmons, S. J., Cheever, J., Leonard, E., & Macunovich, D. (1969). School failures: Now and tomorrow. *Developmental Psychology, 1,* 134–146.

Forness, S., Kavale, K., & Lopez, M. (1993). Conduct disorders in school: Special education eligibility and co-morbidity. *Journal of Emotional and Behavioral Disorders, 1,* 101–108.

Franca, V. M., Kerr, M. M., Reitz, A. L., & Lambert, D. (1990). Peer tutoring among behaviorally disordered students: Academic and social benefits to tutor and tutee. *Education and Treatment of Children, 13,* 109–128.

Francis, D. J., Shaywitz, S. E., Stuebing, K. K., Shaywitz, B. A., & Fletcher, J. M. (1996). Developmental lag versus deficit models of reading disability: A longitudinal, individual growth curves analysis. *Journal of Educational Psychology, 1,* 3–17.

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.

Glassberg, L. A., Hooper, S. R., & Mattison, R. E. (1999). Prevalence of learning disabilities at enrollment in special education students with behavioral disorders. *Behavioral Disorders, 25,* 9–21.

Greenwood, C. R. & Delquadri, J. (1995). Classwide peer tutoring and the prevention of school failure. *Prevention of School Failure, 39*(4), 21–25.

Gunter, P. L., & Denny, R. K. (1998). Trends and issues in research regarding academic instruction of students with emotional and behavioral disorders. *Behavioral Disorders, 24,* 44–50.

Hinshaw, S. P. (1992a). Academic underachievement, attention deficits, and aggression: Comorbidity and implications for intervention. *Journal of Consulting and Clinical Psychology, 60,* 893–903.

Hinshaw, S. P. (1992b). Externalizing behavior problems and academic underachievement in childhood and adolescence: Causal relationships and underlying mechanisms. *Psychological Bulletin, 111,* 127–155.

Individuals with Disabilities Education Act of 1990, 20 U.S.C.

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

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

Kauffman, J. M. (2001). Characteristics of emotional and behavioral disorders of children and youth (7th ed.). Upper Saddle River, NJ: Merrill/Prentice Hall.

King-Sears, M. E., & Bradley, D. F. (1995). Classwide peer tutoring: Heterogeneous instruction in general education classrooms. *Preventing School Failure, 40*(1), 29–35.

Kortering, L. J., & Blackorby, J. (1992). High school dropout and students identified with behavioral disorders. *Behavioral Disorders, 18,* 24–32.

Lambert, N. M., Hartsough, C. S., & Zimmerman, I. L. (1976). The comparative predictive efficiency of intellectual and nonintellectual components of high school functioning. *American Journal of Orthopsychiatry, 46,* 109–122.

Locke, W. R., & Fuchs, L. S. (1995). Effects of peer-mediated reading instruction on the on-task behavior and social interaction of children with behavior disorders. *Journal of Emotional and Behavioral Disorders, 3,* 92–99.

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.

Maher, C. A. (1982). Behavioral effects of using conduct problem adolescents as cross-age tutors. *Psychology in the Schools, 19,* 360–364.

Mathes, P. G., & Fuchs, L. S. (1994). The efficacy of peer tutoring in reading for students with mild disabilities: A best-evidence synthesis. *School Psychology Review, 23,* 59–80.

Mathes, P. G., Grek, M. L., Howard, J. K., Babyak, A. E., & Allen, S. H. (1999). Peer-Assisted Learning Strategies for first-grade readers: A tool for preventing early reading failure. *Learning Disabilities Research and Practice, 14,* 50–60.

Maughan, B., Pickles, A., Hagell, A., Rutter, M., & Yule, W. (1996). Reading problems and antisocial behavior: Developmental trends in comorbidity. *Journal of Child Psychology and Psychiatry, 37,* 405–418.

McMichael, P. (1979). The hen or the egg? Which comes first—antisocial emotional disorders or reading disability? *British Journal of Educational Psychology, 49,* 226–238.

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

Osguthorpe, R. T., & Scruggs, T. E. (1986). Special education students as tutors: A review and analysis. *Remedial and Special Education, 7*(4), 15–25.

Patterson, G. R., DeBaryshe, B. D., & Ramsey, E. (1989). A developmental perspective on antisocial behavior. *American Psychologist, 44,* 329–335.

Perfetti, C. A., Beck, I., Bell, L. C., & Hughes, C. (1987). Phonemic knowledge and learning to read are reciprocal: A longitudinal study of first grade children. *Merrill-Palmer Quarterly, 33,* 283–319.

Richmond, B. O., & Blagg, D. E. (1985). Adaptive behavior, social adjustment, and academic achievement of regular and special education children. *The Exceptional Child, 32,* 93–98.

Rock, E. E., Fessler, M. A., & Church, R. P. (1997). The concomitance of learning disabilities and emotional/behavioral disorders: A conceptual model. *Journal of Learning Disabilities, 30,* 245–263.

Rogers-Adkinson, D. G., & Griffith, P. L. (1999). *Communication disorders and children with psychiatric and behavioral disorders.* San Diego, CA: Singular.

Ruhl, K. L., & Berlinghoff, D. H. (1992). Research on improving behaviorally disordered students' academic performance: A review of the literature. *Behavioral Disorders, 17,* 178–190.

Rylance, B. J. (1997). Predictors of high school graduation or dropping out for youths with severe emotional disturbances. *Behavioral Disorders, 23,* 5–17.

Sampson, O. C. (1966). Reading and adjustment: A review of the literature. *Educational Research, 8,* 184–190.

Sanger, D., Maag, J. W., & Shapiro, N. R. (1994). Language problems among students with emotional and behavioral disorders. *Intervention in School and Clinic, 30,* 103–108.

Scruggs, T. E., Mastropieri, M. A., & Richter, L. (1985). Peer tutoring with behaviorally disordered students: Social and academic benefits. *Behavioral Disorders, 10,* 283–294.

Shisler, L., Top, B. L., & Osguthorpe, R. T. (1986). Behaviorally disordered students as reverse-role tutors: Increasing social acceptance and reading skills. *B.C. Journal of Special Education, 10,* 101–119.

Stanton, W. R., Feehan, M., McGee, R., & Silva, P. A. (1990). The relative value of reading ability and IQ as predictors of teacher-reported behavior problems. *Journal of Learning Disabilities, 23,* 514–517.

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

Wagner, M. M. (1995). Outcomes for youths with serious emotional disturbance in secondary school and early adulthood. *The Future of Children: Critical Issues for Children and Youths, 5,* 90–112.

Williams, S., & McGee, R. (1994). Reading attainment and juvenile delinquency. *Journal of Child Psychology and Psychiatry, 35,* 441–459.

Wood, S. J. ,& Cronin, M. E. (1999). Students with emotional/behavioral disorders and transition planning: What the follow-up studies tell us. *Psychology in the Schools, 36,* 327–345.

AUTHORS' NOTE:

Preparation of this manuscript was funded in part by the Office of Special Education Programs, U.S. Department of Special Education (Grant No. H324D000014). For information concerning the K-PALS curriculum, contact pals@vanderbilt.edu. Correspondence concerning this investigation can be sent to the first author at katherine.b.falk@vanderbilt.edu. Requests for reprints can be sent to Katherine Falk, Department of Special Education, Box 328, Peabody College, Vanderbilt University, Nashville, TN 37203.

AUTHORS:

KATHERINE B. FALK, Project Coordinator, and JOSEPH H. WEHBY Assistant Professor, Department of Special Education, Peabody College, Vanderbilt University, Nashville, TN.

MANUSCRIPT:

Initial Acceptance:	9/20/00
Final Acceptance:	1/22/01