

# The National Reading Panel Guidepost: A Review of Reading Outcome Measures for Students With Emotional and Behavioral Disorders

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*ABSTRACT: In 2000, the National Reading Panel compiled a definitive report of effective methods for reading instruction. As a population that generally demonstrates numerous problems with reading, students with emotional and behavioral disorders may benefit from the National Reading Panel's published findings. This review examined and compared the number and outcomes of published reading studies for students with emotional and behavioral disorders before and after the release of the panel's report. Results from the 21 studies meeting inclusion criteria indicated a five-fold increase in publication rate since 2000 and a shift from single to multiple reading measures as study outcomes. Additional results appear consistent with reading conclusions drawn by the National Reading Panel. This review also addresses future directions for researchers.*

■ Students with emotional and behavioral disorders (E/BD) exhibit a number of reading challenges (Levy & Chard, 2001). Although most students with disabilities have some type of reading difficulties (U.S. Department of Education, 2006), students with E/BD not only demonstrate low reading ability but also receive some of the lowest academic grades of any group (Sutherland & Singh, 2004). It seems that the lack of reading progress poses a significant problem (Bos, Coleman, & Vaughn, 2002). For example, students with E/BD demonstrate significantly fewer gains than students with learning disabilities by the end of elementary school (Anderson, Kutash, & Duchnowski, 2001). The lack of progress in reading may contribute to the fact that many students with E/BD leave school without graduating, affecting posteducation outcomes (Anderson et al., 2001; Sutherland & Singh, 2004). Previous literature reviews (e.g., Coleman & Vaughn, 2000; Lane, 2004; Levy & Chard, 2001; Pierce, Reid, & Epstein, 2004; Rivera, Al-Otaiba, & Koorland, 2006; Ruhl & Berlinghoff, 1992; Ryan, Reid, & Epstein, 2004; Vaughn, Levy, Coleman, & Bos, 2002) examining reading and academic interventions for students with E/BD report a paucity of research. Furthermore, the existing research lacks a clearly defined direction. Considering

that students with E/BD number almost 500,000 nationally, the gaps in research have become objectionable (Ryan et al., 2004).

Acknowledging a lack of reading research with students with E/BD, Landrum, Tankersley, and Kaufmann (2003) make a persuasive argument. Landrum et al. suggest that students involved in academic intervention studies, reading included, exhibit some of the same educational and behavior problems displayed by those with E/BD. Rather than employing special interventions for an E/BD population, Landrum et al. assert that consistent implementation of proven methods (e.g., direct instruction, peer tutoring, etc.; see also TeachingLD, 2007) with students with E/BD makes the intervention special. Because reading represents the most critical skill for learners (e.g., increasing educational opportunities, promoting social adjustment, providing access to employment, assisting lifelong learning; McCormick, 1995), E/BD researchers can refer to outside sources of proven reading methods. Reviewing the National Reading Panel's (2000) outcomes may have compelling application for students with E/BD.

In 1997, Congress initiated a chain of events that culminated with the formation of the National Reading Panel (NRP). The panel had the express mission to "assess the status of

research-based knowledge, including the effectiveness of various approaches to teaching students to read" (NRP, 2000, p. 1–1). Following much debate and public input, the NRP agreed to analyze the following specific reading areas: alphabetics, fluency, comprehension, teacher education, computer technology, and reading instruction (defined in *Table 1*). After examining more than 115,000 reading research articles, the NRP completed a review focused on each topic.

By dividing alphabetics into two separate parts, the NRP (2000) suggested that explicitly instructing phonemic awareness helps students across a variety of ages to read and spell. In addition, students maintained improvements well after the removal of phonemic awareness instruction. Interventions targeting phonics, the second part of alphabetics, have the greatest effect on students when instructed early in a student's academic career. The most effective phonics instruction occurred explicitly and systematically. Following an explicit theme, the NRP indicated that students benefit the most from fluency instruction delivered directly and from practicing fluency with guided repeated readings.

The NRP (2000) divided reading comprehension into three distinct parts (i.e., vocabulary, text, and teacher training of comprehension strategies) and presented those results individually. Although articles meeting the criteria were not located, summary data trends suggest that effective vocabulary instruction can occur directly and indirectly, through repetition and multiple examples, and in context. However, using single methods does not provide students the best chance to succeed.

Unlike vocabulary, the panelists found many text comprehension studies that met the criteria and shared their overall findings. The NRP (2000) concluded that employing multiple strategies for building comprehension increases near transfer (i.e., the student answers, creates questions, and recalls information). Data from teacher-training articles show that teachers can learn to teach strategies effectively and proficiently, which in turn has a positive result for their students. Once they extended their scope to overall teacher training, the NRP found that these studies reported positive yet varied results and computers. Computer-assisted learning, although showing promise for instruction, will probably greatly improve as technology advances.

The NRP's (2000) recommendations provide effective research-supported techniques for instructing reading across multiple sub-skills. For researchers and practitioners of E/BD, these conclusions validate some techniques already in practice while offering additional reading methods. Although very few studies meeting criteria included students with E/BD, researchers and practitioners exploring reading instruction for students with E/BD can use the findings contained in the NRP as a starting point based on logical arguments such as those posed by Landrum et al. (2003); methods validated by research have a great likelihood that they will work, even for students with E/BD.

Previous reviews have focused broadly on academic interventions for students with E/BD across subject areas (e.g., Lane, 2004; Pierce et al., 2004; Ruhl & Berlinghoff, 1992; Ryan et al., 2004) or more specifically on reading interventions for younger students with E/BD (e.g., Coleman & Vaughn, 2000; Rivera et al., 2006; Vaughn et al., 2002). The purpose of this literature review examines reading intervention research for students with E/BD educated in public school settings since 1975. This review addresses two specific questions: (a) Have the number of studies using reading interventions for students with E/BD served in public school settings differed before and after the publication of the NRP's (2000) report? and (b) How have studies focusing on reading interventions for students with E/BD served in public school settings differed before (1976–2000) and after (2001–2006) the NRP findings with regard to alphabetics (i.e., phonemic awareness and phonics), fluency, comprehension (i.e., vocabulary and text), and the use of computer technology for reading instruction?

## Method

The present review initially located articles through a computerized search of the PsycINFO, PsyARTICLES, and ERIC databases. Descriptors and all possible truncations included *reading fluency*, *reading achievement*, *reading attainment*, *reading comprehension*, or *reading development and instruction*, *intervention*, *strategy*, *teaching*, or *programming* and *emotional disturbance*, *behavior disturbance*, *emotional disorder*, *behavior disorder*, *serious emotional disturbance*, or *conduct disorder*. An ancestral search of identified articles and pertinent literature reviews (Lane,

**TABLE 1**  
**Defined Areas Examined by the National Reading Panel (2000)**

Reading Area	Definition
Alphabetics: phonemic awareness	"... the ability to focus on and manipulate phonemes through spoken words" (pp. 2–10)
Alphabetics: phonics	Using grapheme-phoneme correspondences to decode or spell words
Fluency	Reading with speed, accuracy, and proper expression
Comprehension: vocabulary	Studies focusing on teaching word recognition and meaning
Comprehension: text	Reading connected text with understanding
Comprehension: teacher training of comprehension strategy instruction	Studies that train teachers to use strategy instruction for comprehension
Teacher training of reading instruction	Studies that train teachers to teach reading to students
Computer technology and reading instruction	The ability and efficacy of computers to actively instruct reading

2004; Mooney, Epstein, Reid, & Nelson, 2003; Mooney, Ryan, Uhing, Reid, & Epstein, 2005; Pierce et al., 2004; Rivera et al., 2006; Ruhl & Berlinghoff, 1992; Ryan et al., 2004) followed the computerized search. An additional step involved a hand search of two journals focusing on students with E/BD, the *Journal of Emotional and Behavioral Disorders* and *Behavioral Disorders*.

Articles had to meet all of the following criteria for acceptance in this review:

1. Appear in a peer-reviewed journal article published after the passage of Public Law 94–142 in 1975.
2. Directly measure the effects of at least one independent variable (i.e., instruction or enhancement of a reading skill) on a primary dependent variable of a specific reading behavior (e.g., increase in words read). Therefore, the review's focus remained solely on the effect of reading interventions on specific reading behaviors. Articles met exclusion criteria if researchers reported nondescript reading-dependent variables (e.g., Ayllon, Kuhlman, & Warzak, 1982), did not disaggregate reading scores (e.g., Maher, 1984), or examined curricular modifications only (e.g., McLaughlin, 1992).
3. Include participants who attended kindergarten through 12th grade at the time of the study and had a sole identification of a behavioral disorder (BD), emotional disorder (ED), serious emotional disturbance (SED), or E/BD according to state educational guidelines. In the absence of explicit verification status, the review considered participants served in a self-contained classroom for emotional or behavioral

difficulties meeting criteria for ED or BD (Mooney et al., 2003).

4. Use an experimental or quasi-experimental design. Exclusion criteria included group designs that included multiple participant categories that did not disaggregate data for students meeting BD, ED, SED, or E/BD criteria (e.g., Scruggs & Osguthorpe, 1986).
5. Based on this review's question, the study had to occur in a public school setting (i.e., self-contained classroom, resource room, or general education classroom). Excluded articles included those that had students in a residential school (e.g., Gable & Shores, 1980), private laboratory school (e.g., McCurdy, Cundari, & Lentz, 1990), or a university laboratory or affiliated school (e.g., Skinner & Shapiro, 1989).

The computerized search generated 477 articles, 14 of which met inclusion criteria. An ancestral search of these articles and pertinent literature reviews resulted in identification of 5 additional articles meeting criteria. The hand search produced 1 additional article. The qualifying 20 articles, noted with an asterisk in the reference section, meeting review criteria contained 21 studies published in 11 journals.

Initial coding for the review resulted in a division of identified studies into two groups (pre-2000 and 2001–2006) based on publication date. Then, each study received a code based on the reported outcomes of the NRP (2000). Groups of studies included alphabetics, fluency, comprehension, and computer instruction. Studies reporting multiple outcomes (e.g., alphabetics and fluency) received a multiple-outcome grouping. Once separated, information gathered from each study became the

setting/demographics, specific interventions, dependent measures, and study outcomes.

## Results

This review organizes the results into two sections. The first section addresses the publication rate of reading studies targeting students with E/BD in public school settings before and after the NRP (2000). The second section centers on comparing identified articles along each of the aforementioned outcome categories.

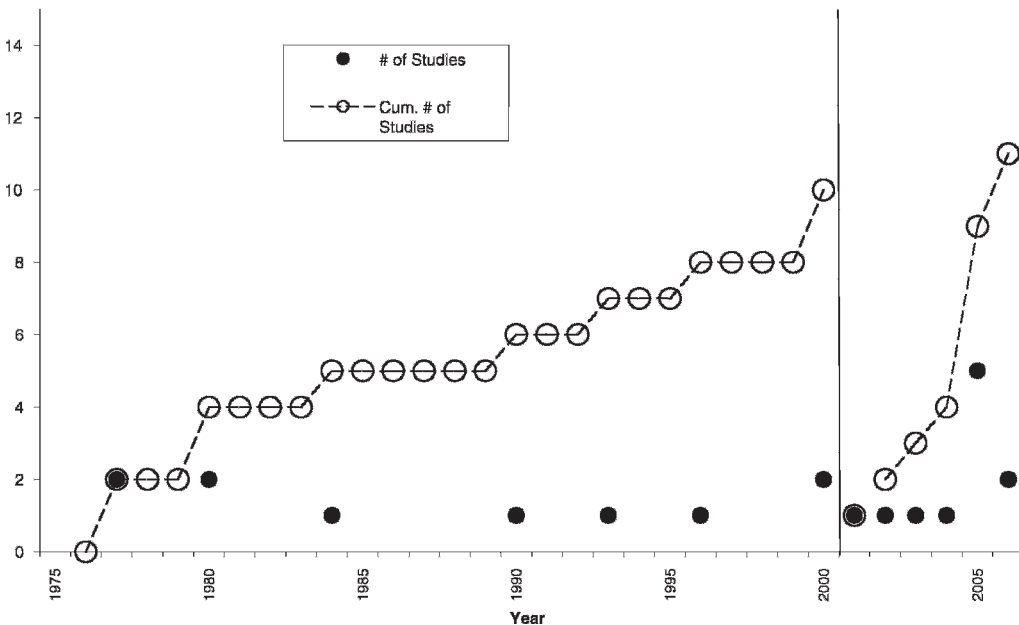
### Publication Rate Before and After 2000

Figure 1 displays the frequency of studies per year and cumulative frequency of studies pre- and post-2000. Dots represent the number of studies published per year. The open circles connected by dashed lines represent cumulative numbers of studies published before and after 2000, with the line distinguishing the release of NRP (2000) report.

Examining the 21 research studies, 10 studies (Babyak, Koorland, & Mathes, 2000; Cochran, Feng, Cartledge, & Hamilton, 1993;

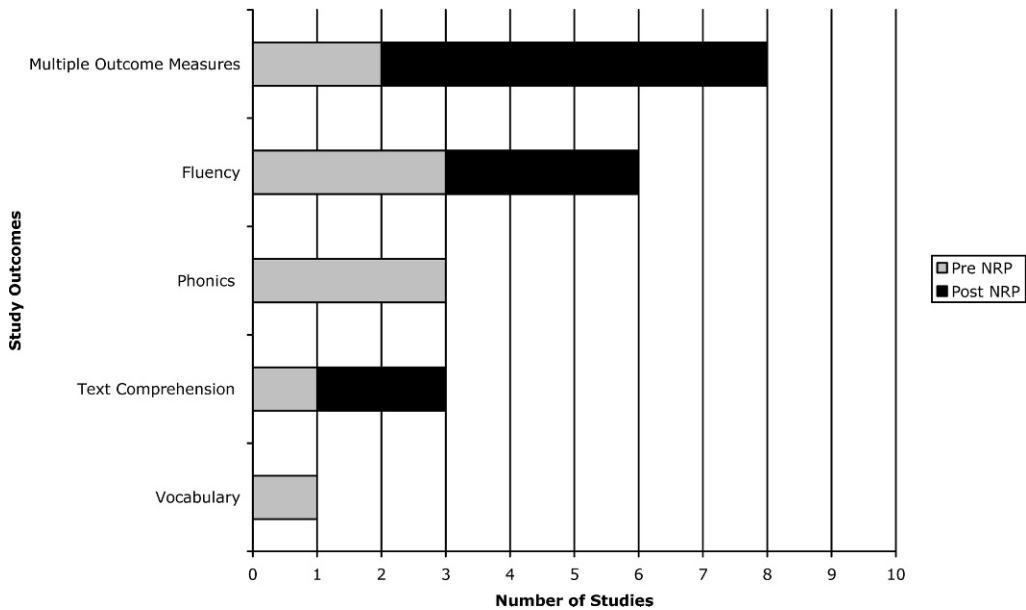
Daly, Martens, Kilmer, & Massie, 1996; Dawson, Venn, & Gunter, 2000; Polsgrove, Reith, Friend, & Cohen, 1980; Reith, Polsgrove, Raia, Patterson, & Buchman, 1977; Reith, Polsgrove, Semmel, & Cohen, 1980; Rose, 1984; Schuster, Stevens, & Doak, 1990) appeared between the time of the authorization of PL 94-142 in 1975 and when the NRP (2000) disseminated its results. Researchers published approximately one study that met inclusion criteria for this review every 30 months during this time. Since 2000, researchers have generated 11 articles (Barton-Arwood, Wehby, & Falk, 2005; Blankenship, Ayres, & Langone, 2005; Daly, Garbacz, Olson, Persampieri, & Ni, 2006; Falk & Wehby, 2001; Hale et al., 2005; Lingo, Slaton, & Jolivet, 2006; Scott & Shearer-Lingo, 2002; Staubitz, Cartledge, Yurick, & Lo, 2005; Strong, Wehby, Falk, & Lane, 2004; Wehby, Falk, Barton-Arwood, Lane, & Cooley, 2003; Wehby, Lane, & Falk, 2005) focused on reading for students with E/BD. The rate of journal articles meeting criteria for this review increased to almost one study every 6 months, a substantial increase in the publication rate.

**Number of studies per year and cumulative studies pre- and post-NRP (2000)**



**Figure 1.** Number of emotional and behavioral disorders reading studies published per year and the cumulative number of studies published before and after National Reading Panel (2000).

## Overall Study Outcomes Grouped Before and After the NRP



**Figure 2.** Overall reading outcomes by study divided before and after National Reading Panel (2000).

### Reading Intervention Outcomes

An extended bar graph, *Figure 2*, illustrates E/BD reading research articles by outcome from 1976 to 2006. Each bar represents the total number of studies meeting criteria for each outcome. Partly shaded areas of each bar show the number of studies occurring prior to 2000, with fully shaded areas reflecting published research after 2000.

An analysis of *Figure 2* shows that eight studies (Barton-Arwood et al., 2005; Falk & Wehby, 2001; Polsgrove et al., 1980; Reith et al., 1977; Staubitz et al., 2005; Strong et al., 2004; Wehby et al., 2003; Wehby et al., 2005) reported investigating reading instruction based on multiple outcomes. Remaining bars show that six studies (Daly et al., 1996; Daly et al., 2006; Dawson et al., 2000; Lingo et al., 2006; Rose, 1984; Scott & Shearer-Lingo, 2002) monitored fluency, three studies (Cochran et al., 1993; Reith et al., 1977; Reith et al., 1980) phonics, three studies (Babyak et al., 2000; Blankenship et al., 2005; Hale et al., 2005) text comprehension, and one study (Schuster et al., 1990) vocabulary instruction. Although phonemic awareness was included in some multiple-outcome studies, the identified research base did not report phonemic awareness measures in isolation. In addition,

computer instruction did not appear in any study.

### Alphabetics

#### *Phonics instruction*

All three phonics instruction studies (*Figure 2*) had publication dates prior to the NRP report (2000; Cochran et al., 1993; Reith et al., 1977; Reith et al., 1980). These studies cover 30% of the research predating 2000. Each study assessed unknown sight-word acquisition with either one student in a self-contained classroom (Reith et al., 1977; Reith et al., 1980) or with eight pairs of students in a pullout setting (Cochran et al., 1993) aged 7 to 15 years.

The three studies applied different experimental approaches to sight-word learning. In the first study, Reith et al. (1977) calculated the effect of earning free time on new words learned during one 20-min session per day for 16 weeks. Without changing any instructional approach, one student read four more words per week when able to earn free time as compared with baseline. In the second study, Reith et al. (1980) reported that by adding 5 min of instruction time per session during the intervention, another student correctly identi-

fied eight more words per day when compared with baseline. The student also increased correct responses from 17 to 40 on a 75-point weekly review test. Sessions lasted between 5 and 10 min across the 23 days of the study.

As an alternative to using teachers to deliver instruction, Cochran et al. (1993) had older students tutor younger students. Tutoring sessions occurred during thirty-two 30-min sessions over 8 weeks. Tutor responsibilities included teaching (i.e., model, prompt, check), testing, and charting tutees responses. Following instruction and matched with comparison peers, tutees increased correct sight-word responses by an average of 22.25% and tutors by an average of 11.75%.

## Fluency

In the six reading fluency studies (*Figure 2*), three (Daly et al., 1996; Dawson et al., 2000; Rose, 1984) appear prior to 2000 (30% of the total) and three appear after (27% of the total; Daly et al., 2006; Lingo et al., 2006; Scott & Shearer-Lingo, 2002). Settings included a self-contained classroom (Daly et al., 1996; Scott & Shearer-Lingo, 2002), resource room (Lingo et al., 2006; Rose, 1984), general education classroom (Dawson et al., 2000), and a pullout setting (Daly et al., 2006). There number of students ranged from one to five, and they were aged 7 to 13 years.

Two studies (Dawson et al., 2000; Rose, 1984) addressed the effects of different previewing options on reading fluency. Rose compared no previewing, silent previewing, and teacher previewing 2 to 6 min each day for 33 consecutive school days on 1-min timings. Dawson et al. balanced seven opportunities of no previewing, computer-read models, and teacher-read models with each session lasting from 3 to 6 min. Rose found that students demonstrated fewer errors and more correct words per minute after listening to a teacher-previewed passage. Similarly, Dawson et al. noted quicker and more accurate student responding following the teacher-previewed model.

Two of the post-NRP (2000) studies, Lingo et al. (2006) and Scott and Shearer-Lingo (2002), reported the effects of commercially available programs on oral reading fluency. Lingo et al. used *Corrective Reading* with two students across an average of eight 45-min intervention sessions. For three students, Scott and Shearer-Lingo implemented *Teach Your*

*Child to Read in 100 Easy Lessons* and *Great Leaps* 10 to 15 min per day for 50 consecutive school days. In both studies, students' oral reading fluency increased. Lingo et al. also included generalized reading passages during which students read approximately 20 more words per minute with five fewer errors compared with their baseline performance.

The remaining two fluency studies, one prior (Daly et al., 1996) and one following (Daly et al., 2006) the NRP (2000), tested the effect of phonic instruction on reading fluency. Daly et al. (1996) used approximately 80 min across eight sessions for phonics instruction with one student. Following each session, the student read four assessment passages across matched, single-consonant/short-vowel words and unmatched, single-consonant/long-vowel words and high and low content overlap (i.e., to the instructed phonics skill). The student demonstrated the highest degree of fluency during matched passages with high content overlap and maintained those scores in 1-month follow-up assessments (Daly et al., 1996). Using similar phonics instruction components (i.e., modeling, practice, error correction, and performance feedback), Daly et al. (2006) examined the effects of instructional and reward choice (i.e., token economy) on reading fluency. Students had a maximum of 10 min available for instructional choice on four separate passage sessions. Following instructional and reward choice phases, both students increased reading fluency and preserved gains during maintenance (Daly et al., 2006).

## Comprehension

### *Vocabulary instruction*

*Figure 2* shows vocabulary instruction occurring in one study (Schuster et al., 1990), representing 10% of the articles published before 2000. Working individually in a resource room, Schuster et al. taught unknown vocabulary words and definitions on flash cards to one 10-year-old student. Each probe and instructional session consisted of 30 trials (i.e., each word presented six times) and lasted 10 min. The 5-s time delay procedure resulted in the student's completing both five-word lists at 100% accuracy within four instructional sessions and 100% during the maintenance checks at 6, 10, and 14 weeks following the study. Schuster et al. also reported that the student demonstrated generalization at the

conclusion of the study by naming the word when presented with the definition.

### *Text comprehension instruction*

As shown in *Figure 2*, the three text comprehension studies (Babyak et al., 2000; Blankenship et al., 2005; Hale et al., 2005) incorporated 10% of those published before 2000 and 18% of those published since. Each of these studies included between one and three students in either a general education setting (Blankenship et al., 2005) or students pulled out for individualized instruction (Babyak et al., 2000; Hale et al., 2005). Students ranged in age from 11 to 15 years.

Two of the studies (Babyak et al., 2000; Blankenship et al., 2005) used similar interventions. After reading material in both studies, students used graphical organizers to arrange and pull out main ideas. Babyak et al. used the Cooperative Story Mapping component from the Peer-Assisted Learning Strategies (PALS) program across six 30-min sessions, and Blankenship et al. instructed students to use the Inspiration software mapping aid across eleven 20-min sessions. With these interventions, students stated more correct story retells and grammar elements and scored higher on comprehension questions, chapter quizzes, and chapter tests.

As an alternative to providing instruction, Hale et al. (2005) measured student text comprehension following different types of reading models across nine sessions, each of which lasted an average of 16 min. Students silently read passages, listened to the teacher read the passage, or listened to the teacher while they read the passage. Students answered more correct comprehension questions following sessions in which they read with the teacher compared with listening or silently reading the passages.

### **Multiple Outcomes**

Multiple-outcome research (Barton-Arwood et al., 2005; Falk & Wehby, 2001; Polsgrove et al., 1980; Reith et al., 1977; Staubitz et al., 2005; Strong et al., 2004; Wehby et al., 2003; Wehby et al., 2005) encompassed 20% of the studies published before 2000 and 55% of the reading studies after (*Figure 2*). Within these eight studies, four distinct subgroups emerged. Three studies (Falk & Wehby, 2001; Wehby et al., 2003;

Wehby et al., 2005) combined phonemic awareness and phonics, three studies (Polsgrove et al., 1980; Staubitz et al., 2005; Strong et al., 2004) combined comprehension and fluency, one study combined alphabetic and fluency (Barton-Arwood et al., 2005), and one study combined alphabetic and comprehension (Reith et al., 1977).

### *Phonemic awareness and phonics*

Falk and Wehby (2001), Wehby et al. (2003), and Wehby et al. (2005) examined the effects of commercially available curricula and instructional programs on one or two students in a self-contained classroom. Total time spent instructing each student ranged from approximately 11 hr to 60 hr. In each study, the researchers combined different commercially available interventions. These combinations included Kindergarten Peer Assisted Learning Strategies (K-PALS) and teacher-directed phonics activities (Falk & Wehby, 2001), Open Court Reading and PALS (Wehby et al., 2003), and Scott Foresman Reading and Phonological Awareness Training for Reading (Wehby et al., 2005).

These studies (Falk & Wehby, 2001; Wehby et al., 2003; Wehby et al., 2005) measured either phonemic awareness (i.e., segmentation, blending, letter naming, initial sound fluency) or phonics (i.e., letter sounds, nonsense-word fluency, sight words). The researchers measured each dependent variable as correct responses per minute and found either moderate (Wehby et al., 2003) or little to no gains (Falk & Wehby, 2001; Wehby et al., 2005). Wehby et al. (2005) found that letter naming, nonsense word, and onset fluency gains were not maintained during follow-up.

### *Comprehension and fluency*

Researchers (Polsgrove et al., 1980; Staubitz et al., 2005; Strong et al., 2004) addressing reading comprehension and fluency established moderate to strong student reading gains. Articles reported testing an average of four students aged 10 to 18 years from approximately 7 hr in a pullout setting (Polsgrove et al., 1980; Staubitz et al., 2005) to 63 hr of intervention in a self-contained classroom (Strong et al., 2004). Staubitz et al. and Strong et al. had students practice fluency and comprehension following peer-mediated repeated readings. In addition, Strong et al.

compared performance during Corrective Reading lessons with and without repeated readings. Polsgrove et al. compared different instructional strategies (i.e., listening to the passage, corrective feedback, and silent rehearsal) alone and in combination with performance feedback/reward contingency.

All three studies reported moderate to strong outcome gains. Reading fluency and comprehension increased with Corrective Reading instruction, Corrective Reading in combination with repeated readings, and repeated readings alone (Staubitz et al., 2005; Strong et al., 2004) as compared with baseline conditions. Polsgrove et al. (1980) found the greatest fluency and comprehension gains during phases with corrective feedback, an instructional method, and a performance feedback/reward contingency.

### *Alphabetics and fluency*

Barton-Arwood et al. (2005) examined the effect of combined interventions on alphabetics and fluency. They spent approximately 49 hr intervening with two self-contained students with E/BD using a combination of Horizons Fast Track AB and PALS over a 14-week period. They measured effectiveness of instruction on phonemic awareness (i.e., segmentation), phonics (i.e., nonsense-word fluency, sight words), and oral reading fluency once per week. The combination of Horizons Fast Track AB and PALS showed increasing trends from baseline to treatment for segmentation, nonsense-word fluency, and sight-word reading with moderate increases for reading fluency.

### *Alphabetics and comprehension*

The last multiple-measures study (Reith et al., 1977) compared reading workbook page completion with and without a reward contingency. Workbook tasks consisted of both comprehension and decoding exercises. The student completed more workbook assignments and with increased accuracy when able to earn additional free time. Students continued accurate completion for 2, 7, and 12 weeks following the completion of the study.

## **Discussion**

The number of published pre- and post-2000 studies suggests a possible link between

the NRP's report (2000) and reading research for students with E/BD. Reading studies doubled in number since 2000 and measured a five-fold increase in publication rate for articles that met inclusion criteria. Although other systematic variables may have contributed to the publication increase, several factors suggest a link with the NRP report. Namely, 3 of the 11 studies (Staubitz et al., 2005; Strong et al., 2004; Wehby et al., 2005) published since 2000 cite the NRP as guiding aspects of their research.

The combination of the NRP's report in conjunction with other factors may help interpret this rapid change. For instance, researchers may have started to respond to reading and academic intervention reviews for students with E/BD. Ruhl and Berlinghoff (1992) initially called for increased attention to this issue. An update by Lane (2004) and a series of other reviews (Coleman & Vaughn, 2000; Levy & Chard, 2001; Pierce et al., 2004; Rivera et al., 2006; Ryan et al., 2004; Vaughn et al., 2002) echoed previous recommendations. However, the increase may still have limited links to the NRP, as three of the reviews (Levy & Chard, 2001; Rivera et al., 2006; Vaughn et al., 2002) explicitly cite the NRP report and findings.

A renewed nationwide awareness in reading may also have accounted for the increased attention since 2000. As part of the No Child Left Behind Act of 2001, Reading First, based on the findings of the NRP (2000), has promoted via federal funding evidence-based reading methods for states and schools (Antunez, 2002). Also at a researcher level, external funding sources may have contributed to the increase. For example, the Institute of Educational Sciences, started in 2002, has continued to award funding for research targeting academic and social outcomes for students with serious emotional disturbance.

## **Overall Study Focus**

Aside from the limited connections linking E/BD reading research and the NRP (2000) report, a closer examination of study breakdowns may provide more insightful comparisons. Many of the more recent studies do not explicitly connect with the NRP but report using effective reading methods. For example, direct instruction, a suggested method for students with E/BD (Landrum et al., 2003), appears in multiple studies focusing on pho-



nemic awareness and phonics (Barton-Arwood et al., 2005; Strong et al., 2004; Wehby et al., 2003) and fluency (Lingo et al., 2006; Scott & Shearer-Lingo, 2002). In addition, researchers (Barton-Arwood et al., 2005; Falk & Wehby, 2001; Wehby et al., 2003) also used peer-tutoring methods, another suggested method, to instruct reading. As E/BD reading research evolves, researchers examine and report reading methods and outcomes that mirror many of the NRP's findings.

### *Multiple outcomes*

Since 2000, students with E/BD have participated in more studies containing multiple reading outcomes (e.g., phonemic awareness, phonics, fluency, and comprehension) than single reading outcomes. In other words, researchers have broadened the focal point from examining singular aspects of reading to multiple features within the hierarchy of reading behaviors. Reading has many component skills, which ultimately combine to form a well-balanced composite behavior essential for remedial, developmental, and advanced readers (Gough & Tunmer, 1986). Research suggests that effective instruction not only breaks down skills into teachable parts but also integrates skills as a unit (NRP, 2000; Swanson, 1999). Therefore, as interventions allow, measuring multiple outcomes across the reading behavior spectrum increases conclusions regarding instructional effectiveness.

Some multiple-outcome studies provide further insight into the relationships of reading behaviors. Reith et al. (1977) reported increases to both phonics and comprehension by showing student increases on workbook exercises. Staubitz et al. (2005) provided clear examples of fluency gains affecting comprehension, with other researchers providing limited evidence of this relationship (Polsgrove et al., 1980; Strong et al., 2004). These findings support conclusions drawn by the NRP (2000) regarding phonics, fluency, and comprehension relationships, suggesting that students with E/BD respond similarly to students without disabilities.

### *Fluency*

Although the NRP (2000) suggests that teachers often neglect fluency instruction, researchers in E/BD have devoted considerable attention to studying oral reading fluency.

Almost 50% of the studies have oral reading fluency measures either in isolation or mixed with other measures (Barton-Arwood et al., 2005; Daly et al., 1996; Daly et al., 2006; Dawson et al., 2000; Lingo et al., 2006; Polsgrove et al., 1980; Rose, 1984; Scott & Shearer-Lingo, 2002; Staubitz et al., 2005; Strong et al., 2004). Researchers found that students read more fluently following guided repeated reading sessions rather than sustained silent reading sessions (Staubitz et al., 2005). In addition, students read less fluently following silently previewed passages than teacher- or computer-previewed models (Dawson et al., 2000; Rose, 1984). These strong findings not only reflect the findings of the NRP but also help establish guided repeated reading methods as effective for students with E/BD (Al Otaiba & Rivera, 2006).

### *Phonemic awareness*

Evidence not only suggests that phonemic awareness plays an important role in the reading process but also demonstrates that deficits in phonemic awareness often predict future reading problems (Bos & Vaughn, 2006; NRP, 2000). Although phonemic awareness outcomes were not examined in isolation, four studies did contain phonemic awareness outcomes (Barton-Arwood et al., 2005; Falk & Wehby, 2001; Wehby et al., 2003; Wehby et al., 2005), and students demonstrated some improvement. Three of the studies reported assessing students' ability to segment and/or blend phonemes (Barton-Arwood et al., 2005; Falk & Wehby, 2001; Wehby et al., 2003). The National Institute for Literacy (2006) named both measures (i.e., segmenting and blending) as central for laying the foundation for future reading skills. Following phonemic awareness gains, Wehby et al. (2003) found that students did not elevate general reading behaviors and points to the brevity of the intervention as an attempt to explain this lack of generalization. These findings support the NRP's (2000) assertion that although it is necessary for reading, phonemic awareness development alone does not guarantee reading gains.

### *Phonics*

As another foundational reading skill, the NRP (2000) discussed the importance of phonics. Phonics outcomes appeared in eight studies, four before 2000 (Cochran et al.,

1993; Reith et al., 1977; Reith et al., 1980) and four after 2000 (Barton-Arwood et al., 2004; Falk & Wehby, 2001; Wehby et al., 2003; Wehby et al., 2005). Earlier studies presented limited outcomes. Although noting improvement, Cochran et al. (1993) and Reith et al. (1980) isolated phonic measures to sight-word learning. More recent research reported outcomes that included additional phonics such as letter-sound correspondence and nonsense-word fluency (Falk & Wehby, 2001; Wehby et al., 2005). These earlier phonic component measures partly result from younger student participants, but examining younger students holds consistent with findings from the NRP, which found phonics introduced before first grade to be more effective than introducing phonics later.

### *Comprehension*

Reading does not take place if a student fails to understand the material (Gough & Tunmer, 1986). Therefore, comprehension plays a vital role in the reading process and the ability of students with E/BD to access the general education curriculum (Blankenship et al., 2005). The research base shows the significance of comprehension because these outcomes appear in 8 of the 21 studies (Babyak et al., 2000; Blankenship et al., 2005; Hale et al., 2005; Polsgrove et al., 1980; Reith et al., 1977; Schuster et al., 1990; Staubitz et al., 2005; Strong et al., 2004) with a variety of assessment methods. Reports included varied questions and answers targeting different meanings of the passage (Babyak et al., 2000; Hale et al., 2005; Polsgrove et al., 1980; Strong et al., 2004), chapter test scores (Blankenship et al., 2005; Reith et al., 1977), cloze procedures (Staubitz et al., 2005), story retells (Babyak et al., 2000), and recalling word definitions (Shuster et al., 1990). The variance of outcomes blends with the evidence posed by the NRP (2000) as a combination of methods, and assessments demonstrate the most effective gains in reading comprehension.

### **Suggestions for Future Research**

Reading research for students with E/BD has increased since 2000. However, it remains unclear if 21 total studies meet the documented reading needs of students with E/BD. Many avenues remain open for investigation. Initial-

ly, researchers can continue to examine reading using the methods and outcomes represented in the current body of literature, especially since 2000.

As a result of exposure to effective reading programs, students with E/BD have demonstrated rapid gains even after short amounts of time (e.g., Wehby et al., 2003). Continuing to examine multiple reading outcomes through the use of these types of programs provides students with much needed opportunities to increase their reading skills.

Another important reading skill, phonemic awareness, did not receive much attention prior to 2000. Therefore, the recent and continued attention for phonemic awareness will likely show positive benefits. Demonstrating improvements to foundational reading skills such as phonemic awareness may affect the lack of early reading gains for younger students with E/BD. However, effective instruction of phonemic awareness must occur explicitly, and performance must be assessed regularly (Barton-Arwood et al., 2005; Foorman, Francis, Fletcher, Schatschneider, & Mehta, 1998; NRP, 2000).

One outcome, oral reading fluency, has received continued attention with regard to students with E/BD. As a quality measure of overall reading ability (Fuchs, Fuchs, Hosp, & Jenkins, 2001), researchers should continue to examine the effects of guided fluency practice (e.g., repeated readings) on students with E/BD. As with other student populations (Chard, Vaughn, Tyler, 2002; Therrien, 2004), using guided repeated readings to improve oral reading fluency may hold both academic and behavioral benefits for students with E/BD. A continued examination of effective fluency practice procedures for other reading skills, such as letter sounds, segmenting, and blending, may also assist students with E/BD as they move along the reading behavior continuum.

Reading comprehension, the most critical reading skill, deserves additional focused study. As supported by the NRP's (2000) report, E/BD reading researchers presented various reading comprehension outcomes. However, the RAND research group asked questions regarding the sensitivity of various comprehension measures relating the reading intervention used (Snow, 2002). Consider oral reading fluency interventions: Do 1-min story retells (Roberts, Good, & Corcoran, 2005) or cloze procedures (Staubitz et al., 2005) best measure reading comprehension for students

with E/BD? Attending to this question, specifically for oral reading fluency, partly addresses another question developed by RAND concerning the relation of reading fluency to reading comprehension and reading motivation (Snow, 2002). Generating answers to these questions may suggest how E/BD reading researchers intervene and improve reading comprehension.

Finally, researchers noted that students with E/BD demonstrate high degrees of variability with reading behaviors (Barton-Arwood et al., 2005; Falk & Wehby, 2001; Wehby et al., 2003). Future studies can examine other factors that may play a role in the acquisition of reading behaviors. Such factors include competing motivating variables, socioeconomic differences, and individual behavioral repertoires.

## Conclusions

Congress asked the National Institute of Child Health and Human Development to convene a national panel of reading experts who would provide a definitive report of effective methods for instructing reading. Since the release of the National Reading Panel's report in 2000, reading research for students with E/BD has changed. Although the available evidence does not establish a direct link, the large jump in publication rate suggests a possible relationship. The increase in E/BD reading research has also shifted from examining only isolated reading behaviors to multiple reading behaviors. Studies and literature reviews have cited findings from the NRP with greater frequency as the reading research base has grown. Therefore, the National Reading Panel may serve as one guidepost for helping researchers evaluate effective outcomes for students with E/BD.

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\*References marked with an asterisk indicate studies included in the literature review.

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