Reading Interventions for Middle and Secondary Students With Emotional and Behavioral Disorders: A Quantitative Review of Single-Case Studies

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Abstract
Many students with emotional and behavioral disorders (EBD) experience learning problems in reading at the middle and secondary school levels. Yet, the academic performance of students with EBD is often overlooked in the research literature. The purpose of this article was to provide a quantitative synthesis of the published, peer-reviewed, single-case research literature on reading interventions for students with or at-risk for EBD. An omnibus nonoverlap effect size of .59 with a 95% confidence interval (CI) = [.54, .64] was found consisting of 219 phase contrasts and 44 participants across the 11 studies included in the review. The findings are discussed in the context of improving the academic and behavioral outcomes of middle and secondary students with EBD.

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Students with or at-risk of emotional and behavioral disorders (EBD) are often recognized by their social-behavioral deficits. However, a considerable number of these students have substantive academic deficits or demonstrate comorbid learning disabilities (LD; Wagner, Kutash, Duchnowski, & Epstein, 2005). The concomitant relationships between EBD and LD and corresponding academic difficulties have been noted in the research literature (Fessler, Rosenberg, & Rosenberg, 1991; Wehby, Falk, Barton-Arwood, Lane, & Cooley, 2003). Many students with EBD have academic profiles similar to those of students with LD and/or could meet the diagnostic criteria for special education services under the LD category (Vaughn, Levy, Coleman, & Bos, 2002; Wagner et al., 2005).

Academically, students with EBD generally lag behind their same-age peers with and without disabilities; the academic performance of secondary students with EBD is generally characterized by low grades, absenteeism, course failure, grade retention, and dropping out (Wagner et al., 2005). In summarizing 40 years of research literature, Trout, Nordness, Pierce, and Epstein (2003) showed that students with EBD consistently perform worse academically than their general education peers. Similarly, Reid, Gonzalez, Nordness, Trout, and Epstein (2004) found overall moderate to large academic deficits (an overall effect size of −.69) for students with EBD when compared with students without disabilities in a comprehensive meta-analysis of the academic status of students with EBD.

Compounding their academic difficulties, students with EBD tend to have (a) difficulties accessing quality instruction, (b) poor compensation and adaptation strategies, (c) low tolerance for frustration, (d) poor self-concept, and (e) social adjustment problems (Rock, Fessler, & Church, 1997). Moreover, students with EBD in middle and high school tend to have limited access to general education content, are often instructed by teachers who do not feel qualified to teach them, and are unlikely to receive needed instructional support services (Mooney, Denny, & Gunter, 2004; Wagner et al., 2005). The academic deficits of students with EBD contributes to poor postschool outcomes, including difficulties gaining meaningful employment (Wagner et al., 2005; Zigmond, 2006), and places them at increased risk for involvement in the criminal justice system (Carter & Wehby, 2003; Lane & Carter, 2006; Wagner et al., 2005).

Outside of behavioral deficits, arguably the most significant factor contributing to the poor academic outcomes of students with EBD is their
reading difficulties (Kauffman, 2010; Lane, Barton-Arwood, Nelson, & Wehby, 2008; Reid et al., 2004). The difficulties of students with EBD in the area of reading are well documented in the literature. For example, Coutinho (1986) found differences in the reading ability of students with EBD and their typical peers at the secondary level. Nationally, Wagner et al. (2005) noted that 60% of students with EBD were functioning at the bottom quartile in reading. Likewise, Lane et al. (2008) examined the academic, social, and behavioral performance of elementary and secondary students with EBD receiving services in a self-contained school and found that students’ scores were well below the 25th percentile on several academic measures including reading. In addition, Siperstein, Wiley, and Forness (2011) tracked the academic progress of three groups of children with or at-risk of EBD over the course of a year and found no significant growth in reading. It is critical, therefore, to focus on the reading skills of students with EBD, especially given the large numbers who have concomitant reading problems (Trout et al., 2003; Wagner et al., 2005).

Reading Interventions for Students With EBD

There is likely no more important skill in modern society than fluent and skillful reading used to extract meaning from text. As students with EBD enter middle and high school, their reading deficits pose particular challenges, as the reading content at the middle/secondary level is generally more difficult to comprehend than at the elementary level. Whereas elementary text focuses on narrative text, middle/secondary focuses on expository text that is characterized by its density and complexity (Hall, Kent, McCulley, Davis, & Wanzek, 2013). For example, in their review of four geography textbooks at the middle school level, Jitendra et al. (2001) found them to be inconsiderate of poor readers, with the text being dense with facts and readability levels around the 10th grade. Unfortunately, many students with EBD (in middle and high school as well as elementary school) read at a much lower level than their same-age peers (Vaughn et al., 2002; Wagner et al., 2005) and require focused and intensive instruction that is often not available in the higher grades (Vaughn et al., 2002).

Research suggests that reading instruction should focus on multiple domains. The influential National Reading Panel (NRP; National Institute of Child Health and Human Development, 2000) report provided the field of reading disabilities with a framework for identifying effective reading interventions across multiple reading domains to include (a) phonological awareness, (b) alphaberics (i.e., phonics), (c) fluency, (d) comprehension, and (e) vocabulary. The results of this report have primarily focused on improving
reading instruction for elementary-level students. Although this is unquestionably a significant endeavor, this should not come at the expense of students at the middle and secondary level, many of whom require alphabetic and fluency-based instruction as well as strategy instruction to facilitate vocabulary acquisition and text comprehension. Biancarosa and Snow (2006) outlined a national agenda for improving reading outcomes for middle and high school students that includes (a) providing direct and explicit comprehension instruction, (b) embedding effective instructional principles in content, (c) building motivation for reading and learning, (d) implementing formative progress monitoring, and (e) using a summative evaluation system. Moreover, Pyle and Vaughn (2012) outlined a multi-tiered response-to-intervention model for the middle school level that would consist of four tiers of instruction over a 3-year period. However, this research agenda has generally not been replicated at the middle and secondary level, especially with respect to students with EBD (Lane & Carter, 2006). There is a lack of research on evidence-based reading interventions for youth with EBD despite the overwhelming need to improve the reading outcomes with this population (Kostewicz & Kubina, 2008).

The absence of research on reading interventions for youth with EBD is noted in several previous literature reviews. Gunter and Denny (1998) reviewed the state of the evidence on academic interventions for students with EBD, noting the lack of experimental research investigating interventions to improve the academic skills for this population of students. Coleman and Vaughn (2000) conducted a review of the literature and found only eight studies that focused on reading interventions for students with EBD. They concluded that little guidance was provided in the literature on reading interventions for students with EBD although this population has significant academic needs. Kostewicz and Kubina (2008) reviewed the literature on reading interventions for students with EBD before and after the NRP report was published in 2000. These authors found 21 reading intervention studies for students with EBD; 10 were published before the report (i.e., from 1975 to 2000) and 11 were published afterwards. In the most recent review to date, Benner, Nelson, Ralston, and Mooney (2010) conducted a meta-analysis of reading interventions for students with or at-risk for EBD and found few single case research (SCR) studies focused on students with EBD at the middle and secondary level.

**Purpose of the Present Study**

The purpose of this review was to determine the state of SCR research literature on reading interventions for middle and high school students with EBD.
Improving reading outcomes for students with EBD at the middle and secondary level is crucial for the successful inclusion of these students into general education classes, accessing the general curriculum, and preventing school dropout. Lane and Carter (2006) pointed to a “near absence of empirically validated academic interventions” for students with EBD, calling the evidence-base for effective academic interventions for students with or at-risk for EBD at the secondary level “almost nonexistent” (p. 67). Both the special education and reading literature typically exclude SCR studies as well as students with EBD from literature reviews of reading practices. SCR is often excluded due to their small $n$, despite being a method of experimentally determining evidence-based practices (Horner et al., 2005). In addition, students with EBD are often excluded from many mainstream educational reviews due to their atypical behavioral and academic characteristics, making identification of evidence-based reading interventions for this population problematic (Wehby, Lane, & Falk, 2003). Moreover, previous reviews on academic instruction for students with EBD (e.g., Benner et al., 2010) have not specifically highlighted those SCR studies that focus on middle- and secondary-level students with EBD or analyzed the literature using a nonoverlap index. This current synthesis provides guidance to the field by specifically focusing on those SCR studies that included middle and secondary students with EBD, by describing each study, and reporting a nonoverlap effect size for each dependent measure in studies included in the review.

**Method**

**Literature Search**

A systematic search of the literature was conducted to identify published studies on the effects of reading interventions for middle and secondary students with EBD. The search involved a three-step process consisting of (a) an electronic database search (ERIC and Academic Search Complete), (b) an archival search of the references for the included studies, and (c) a hand search of the journals in which the studies had been published.

First, sample articles identified from previous reviews of the literature that met inclusion criteria (described in detail later) were reviewed to determine the associated search terms. These terms were checked against the thesaurus for each electronic database to determine additional search terms. The first search string included terms designed to capture studies in which students with EBD were the participants (“behavioral problems,” “behavior disorders,” “emotional disturbances,” and “emotional problems”). The second string included terms designed to capture studies in which reading
interventions were provided (“phonemes,” “reading programs,” “reading instruction,” “literacy education,” “phonological awareness,” “phonics,” “reading fluency,” “reading comprehension,” “vocabulary development,” “oral reading,” “phonology,” “word recognition,” and “decoding”). Finally, the third string included terms designed to capture improvement in student reading outcomes (“reading skills,” “reading difficulties,” and “remedial reading”). A total of 150 articles were identified from the initial electronic database search. Eight duplicate citations were removed, leaving 142 studies to be screened for inclusion. Seven of these articles met the inclusion criteria and were included in the review.

The second step involved an archival search of the references of the included studies from the four previous reviews conducted (Benner et al., 2010; Coleman & Vaughn, 2000; Gunter & Denny, 1998; Kostewicz & Kubina, 2008). One hundred seven cited references were identified to review for potential inclusion. Sixty-four duplicates were removed. The remaining studies were reviewed using the same inclusion criteria as in the initial screening. Three additional articles were included in the review from this archival search.

The third step consisted of a search of the journals in which the studies included in the review had been published. The following journals were reviewed: (a) Behavioral Disorders, (b) Behavioral Interventions, (c) Journal of Applied Behavioral Analysis, (d) Journal of Educational Research, (e) Journal of Emotional and Behavioral Disorders, (f) Journal of Special Education, (g) Journal of Special Education Technology, (h) Preventing School Failure, (i) Psychology in the Schools, and (j) School Psychology Review. The table of contents of each journal was reviewed from 1990 to 2014, leading to the identification of 51 studies for potential inclusion. From these 33 duplicates were removed. The remaining studies were reviewed using the same inclusion criteria as in the initial screening. One additional study was included from this hand search bringing the final sample to 11 studies (i.e., 7 from the initial search, 3 from the archival review, and 1 from the hand search).

**Inclusionary criteria.** Several inclusionary criteria were used to identify studies for this review. For example, the titles and abstract of articles were screened to determine which articles to include in the literature synthesis based on four inclusionary criteria. First, articles considered for inclusion had to be published in a peer-reviewed English language journal. Dissertations and non-peer-reviewed publications were excluded. Second, articles had to use an SCR design that included a graphic display of the time series data disaggregated for each participant. Studies that did not have extractable data were
excluded. Third, studies had to include at least one participant with or at-risk for EBD at the middle/secondary level who was being provided a reading intervention. Distinctions between students with EBD and those who had reading problems versus identified comorbid reading disabilities were not made, and both types were included. Likewise, the term EBD was viewed broadly. Included were middle and secondary students who were not formally labeled with EBD but were described in the study as exhibiting problem behavior or emotional and behavioral difficulties (e.g., oppositional defiant, attention-deficit/hyperactivity disorder [ADHD]) that would place them at-risk for a special education diagnosis of EBD. Fourth, studies had to employ a reading intervention or program as the independent variable that targeted a certain aspect of reading (e.g., phonological awareness, phonics, fluency, comprehension, and/or vocabulary) as the dependent variable.

**Data Extraction**

Data extraction occurred for the descriptive and quantitative portions of the study. Descriptive data coded focused on participants, format, setting, age, grade, research design, independent variable(s), implementer, number of treatment sessions and session length, social validity, treatment fidelity, and interobserver agreement. Initial interrater reliability was conducted on all 11 articles for each category. An initial reliability was found to be 96%. Disagreements were discussed and resolved resulting in an interrater reliability of 100%.

For the quantitative synthesis, data were extracted from the single-case graphs in each study using a five-step process: (a) A JPEG of each graph was generated; (b) each graph was opened in Plot Digitizer; (c) the X and Y axes were calibrated and individual data points were captured; (d) data for each individual point, the time series value (i.e., session number), and the dependent variable measure were captured; and (e) the data were exported to an Excel spreadsheet for management and analysis.

**Effect Size Estimation**

Tau-\(U\) was used for estimating magnitude of effect for each SCR design (Parker, Vannest, & Davis, 2011). This metric is a nonparametric dominance effect size derived from Kendall’s rank correlation and the Mann–Whitney \(U\) between groups test (Parker et al., 2011). Parker et al. (2011) described Tau-\(U\) as an index of nonoverlap of all data points between phases in a SCR design with the unique potential to control for undesirable trend in the baseline phase. Because Tau-\(U\) is a nonoverlap effect size, it does not require that the
data sets meet the assumptions of normal score distribution, constant variance, and interval-level measurement required for ordinary least squares analyses (Parker et al., 2011). For this study, Tau-\(U\) was calculated to determine overall student improvement from the A phase to the B phase(s). For example, a multiple baseline or multiple probe design with three subjects would have three phase contrasts, which would then be aggregated to derive an overall effect size. The same approach would be used to aggregate effects for a multiple baseline across behaviors or tasks. For alternating treatment designs, individual contrasts comparing a single treatment with the baseline were aggregated to derive an overall effect size. Calculations were based on the procedures described by Parker et al. (2011). According to Parker et al. (2011), Tau-\(U\) can be interpreted as the percentage of data that improved between the phases and during the treatment. Moreover, Tau-\(U\) scores range from 0 to 1. There are no set guidelines on interpretation of Tau-\(U\) although Parker et al. (2011) suggested a Tau-\(U\) of .7 or greater is needed to be considered a strong effect. Effect sizes should also be interpreted within the context of the sample of studies included in this review as well as type of dependent measure reported.

**Results**

**Descriptive Variables**

**Participants.** A total of 44 participants were included across all 11 studies. Thirty-five students were identified with an EBD. Of those students, 23 were identified as EBD, and 12 were identified as EBD and had other related disorders, including LD, mild intellectual disability (MID), ADHD, speech language impairment (SLI), conduct disorder (CD), oppositional defiant disorder (ODD), pervasive personality disorder (PPD), depression (D), and other health impairment (OHI). The remaining nine students included in the studies were identified with other disability categories, four students were classified as LD, four OHI, and one OHI and ADHD.

**Format/setting.** Seven studies involved one-on-one reading interventions. Of those, four were conducted in-class in a self-contained classroom (Alber-Morgan, Ramp, Anderson, & Martin, 2007; Browder & Shear, 1996; Scott & Shearer-Lingo, 2002; Stone, Boon, Fore, Bender, & Spencer, 2008), one in-class in a resource classroom (Lingo, Slaton, & Jolivette, 2006), and two were implemented in a pullout setting (Allen-DeBoer, Malmgren, & Glass, 2006; Daly, Garbacz, Olson, Persampieri, & Ni, 2006). In other studies, reading instruction was conducted in a small-group format in a variety of settings.
For example, Hale et al. (2005) conducted it in a small-group pullout setting, whereas Strong, Wehby, Falk, and Lane (2004) implemented a reading intervention using both small-group in a self-contained classroom and a 2:1 format in a pullout setting. In another study by Sutherland and Snyder (2007), a reading intervention was conducted with students working in dyads in a self-contained classroom. Last, although Blankenship, Ayres, and Langone (2005) did not report the format, instruction was provided within a self-contained classroom.

**Age/grade.** Across all studies, the overall mean age of the students was 13 years 4 months and ranged from 11 years 4 months to 18 years 2 months. Students were enrolled in Grades 6 through 9 in a middle and/or high school classroom. Of those reported, two of the studies were implemented in Grades 6 and 7 (Alber-Morgan et al., 2007; Lingo et al., 2006), two in Grade 7 (Daly et al., 2006; Scott & Shearer-Lingo, 2002), one in Grades 7 and 8 (Strong et al., 2004), and finally, two studies were conducted in Grade 9 (Blankenship et al., 2005; Stone et al., 2008). Four of the studies did not report grade levels (Allen-DeBoer et al., 2006; Browder & Shear, 1996; Hale et al., 2005; Sutherland & Snyder, 2007).

**Research designs.** All of the studies used a SCR design. Six employed a multiple baseline design across participants (Alber-Morgan et al., 2007; Allen-DeBoer et al., 2006; Scott & Shearer-Lingo, 2002; Stone et al., 2008; Strong et al., 2004; Sutherland & Snyder, 2007), two used a multiple probe design across participants (Browder & Shear, 1996; Lingo et al., 2006), two used a multiple probe design across behaviors/tasks (Blankenship et al., 2005; Daly et al., 2006), and one used an alternating treatments design (Hale et al., 2005).

**Independent variable.** The focus of instruction for the reading interventions (i.e., the independent variable) was on a variety of outcome measures and reflected a range of intervention components. Interventions for reading fluency included sight-word instruction (Browder & Shear, 1996), a choice instructional method, and a contingency strategy (Daly et al., 2006). Comprehension-fostering interventions included graphic organizers (Blankenship et al., 2005), listening (Hale et al., 2005), and text maps (Stone et al., 2008), whereas studies that targeted both fluency and comprehension outcomes focused on interventions that involved repeated reading (Alber-Morgan et al., 2007), a modified version of the *Corrective Reading* program (Allen-DeBoer et al., 2006), and the *Corrective Reading* program plus repeated reading (Strong et al., 2004). Finally, reading interventions focusing on both fluency and behavior outcomes included reading programs such as the *Corrective Reading* program (Lingo et
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al., 2006), *Teach Your Child to Read in 100 Easy Lessons*, the *Great Leaps Reading* program (Scott & Shearer-Lingo, 2002), and the use of peer-mediated repeated reading instruction (Sutherland & Snyder, 2007).

**Number and length of treatment sessions.** Across all of the intervention studies, the number of treatment sessions ranged from 3 to 60, with sessions lasting from 8 to 45 min.

**Social validity.** Of the 11 studies, only 5 included a social validity measure with students, teachers, or both. Authors of one study conducted a student questionnaire survey, asking students about the use and benefits of text mapping to increase reading comprehension skills (Stone et al., 2008). In the second study, students were interviewed about their ideas and thoughts of repeated reading instruction (Alber-Morgan et al., 2007), whereas the third study surveyed both students and teachers on the use of the *Corrective Reading* program to improve students’ reading skills (Lingo et al., 2006). In the fourth study, a rating scale, Intervention Rating Profile-15 (Witt & Martens, 1983), was used to explore teachers’ views of two instructional interventions, an interspersal treatment package and time delay (Browder & Shear, 1996). Last, in the fifth study, students were surveyed on the use of partner reading, while the teachers completed an adapted Treatment Acceptability Rating Form–Revised (TARF-R) rating scale (Reimers & Wacker, 1988) to measure their level of acceptability toward partner reading (Sutherland & Snyder, 2007).

**Treatment fidelity.** All studies conducted treatment fidelity procedures; however, only nine of the studies reported treatment fidelity measures. Eight of the studies assessed treatment fidelity by direct observation (Alber-Morgan et al., 2007; Allen-DeBoer et al., 2006; Blankenship et al., 2005; Browder & Shear, 1996; Lingo et al., 2006; Stone et al., 2008; Strong et al., 2004; Sutherland & Snyder, 2007), two studies used audio recording (Daly et al., 2006; Hale et al., 2005), and one employed self-reporting (Scott & Shearer-Lingo, 2002). Treatment fidelity was implemented in 16% to 100% of the sessions, with agreement scores ranging from 72.1% to 100%.

**Interobserver agreement.** All studies, except one, reported interobserver agreement measures and were conducted in 9.8% to 100% of the sessions, with agreement scores ranging from 86.1% to 100%.

**Study-Level Overview and Overall Effects**

The focus of this review was to identify research from the SCR literature on reading interventions for middle/secondary students with or at-risk for EBD.
The goal was to determine the state of the literature with regard to reading practices for these students that would improve reading outcomes, in particular, reading outcomes associated with word-level acquisition (i.e., phonological awareness, phonics), fluency, vocabulary acquisition, and text comprehension. Overall, an omnibus effect size of .59 with a 95% confidence interval (CI) = [.54, .64] was found across the 11 studies in the review. Three additional scores were reported for alphabetics and fluency, comprehension, and behavior for which the dependent measures were aggregated. Results indicated an effect size of .68 with a 95% CI = [.61, .75] for the alphabetics and fluency, .65 with a 95% CI = [.55, .73] for comprehension, and .21 with a 95% CI = [.10, .33] for the behavior dependent measures. Similar to Tables 1 and 2, the following results are organized according to the primary intervention outcome, providing an overview of each study and overall effects.

**Alphabetics and fluency.** Browder and Shear (1996) used a multiple probe design across participants to evaluate interspersal sight-word instruction, which interleaves known and unknown words. During the baseline phase, students completed a sight-word test. During the interspersal sight-word instruction, students (a) completed a sight-word test, (b) received interspersal drill instruction with error correction, (c) read a teacher-made practice passage that included known words and new words introduced in the lesson, and (d) completed a 1-min timed reading of a novel passage followed by a teacher-led discussion of the reading. The resulting overall Tau-$U$ was .96 with a 95% CI = [.72, 1.00].

Daly et al. (2006) employed a multiple probe design across tasks to evaluate a choice instructional method and contingency strategy. During baseline, students read a passage aloud. During the choice instructional method and contingency phase, students (a) received an instructional passage; (b) chose whether or not to receive instruction, the type of instruction (i.e., teacher modeling, student oral reading or student oral reading with error correction), and the duration of instruction; (c) received a criterion passage after either completing or declining instruction; (d) reviewed the contingency system; (e) read the criterion passage aloud; (f) received feedback; and (g) received points if the contingency was met. During maintenance, students read a passage aloud. The resulting gains were demonstrated with an overall Tau-$U$ of .67 with a 95% CI = [.53, .82].

**Reading comprehension.** Blankenship et al. (2005) used an adapted multiple probe design across behaviors to examine student-generated graphic organizers. During baseline, students (a) read individually from a chapter and (b) orally answered the chapter quiz. During the student-generated graphic
<table>
<thead>
<tr>
<th>Citation</th>
<th>Participants</th>
<th>Format/setting</th>
<th>Age (Y/M)</th>
<th>Grade</th>
<th>Research design</th>
<th>Independent variable(s)/ implementer</th>
<th>No. of sessions/session length</th>
<th>Social validity</th>
<th>Treatment fidelity (M/S/TA)</th>
<th>Agreement (S/IOA)</th>
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<tr>
<td><strong>Alphabets and fluency outcomes</strong></td>
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<tr>
<td>Browder and Shear (1996)</td>
<td>N = 3 &lt;br&gt;n = 3 MID, EBD</td>
<td>1:1/in-class (self-contained)</td>
<td>12-16</td>
<td>NR</td>
<td>Multiple probe across participants</td>
<td>T: Interspersal sight-word instruction/SPED Teachers</td>
<td>T: 12-32/30 min</td>
<td>Y</td>
<td>DO, 32%, 100%</td>
<td>32%, 93%-99%</td>
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<td>Daly, Garbacz, Olson, Persampieri, and Ni (2006)</td>
<td>N = 2 &lt;br&gt;n = 2 EBD</td>
<td>1:1/pullout</td>
<td>13</td>
<td>7</td>
<td>Multiple probe across tasks</td>
<td>T: Choice instructional method and contingency/graduate students</td>
<td>T: 9/NEI</td>
<td>N</td>
<td>AR, 100%, 94%</td>
<td>100%, 98%</td>
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<td><strong>Comprehension outcomes</strong></td>
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<td>Blankenship, Ayres, and Langone (2005)</td>
<td>N = 3 &lt;br&gt;n = 3 EBD</td>
<td>NR/in-class (self-contained)</td>
<td>15</td>
<td>9</td>
<td>Multiple probe across behaviors</td>
<td>T: Student-generated graphic organizer/SPED teacher</td>
<td>T: 18-22/20 min</td>
<td>N</td>
<td>DO, 20%, 100%</td>
<td>NR</td>
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<td>Hale et al. (2005)</td>
<td>N = 4 &lt;br&gt;n = 2 EBD</td>
<td>Small-group/pullout and 2:1/pullout</td>
<td>12-14</td>
<td>NR</td>
<td>Alternating treatment</td>
<td>T₁: Listening, T₂: Listening while reading, T₃: Silent reading/experimenters</td>
<td>T₁: 5-9, T₂: 6-9, T₃: 3-5/8-25 min</td>
<td>N</td>
<td>AR, NEI, 100%</td>
<td>30%, 100%</td>
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<td>Stone, Boon, Fore, Bender, and Spencer (2008)</td>
<td>N = 4 &lt;br&gt;n = 4 EBD</td>
<td>1:1/in-class (self-contained)</td>
<td>15</td>
<td>9</td>
<td>Multiple baseline across participants</td>
<td>T₁: Teacher-generated text map, T₂: Student-generated text map/SPED teacher</td>
<td>T₁: 3-4, T₂: 4-13/ NR</td>
<td>Y</td>
<td>DO, NR, NR</td>
<td>100%, 95.1%-96.2%</td>
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<td><strong>Combined reading outcomes</strong></td>
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<td>Alber-Morgan, Ramp, Anderson, and Martin (2007)</td>
<td>N = 4 &lt;br&gt;n = 2 EBD</td>
<td>1:1/in-class (self-contained)</td>
<td>12, 13, 15</td>
<td>6-7</td>
<td>Multiple baseline across participants</td>
<td>T₁: Repeated reading, T₂: Repeated reading plus prediction/University professor and doctoral students</td>
<td>T₁: 7-14, T₂: 5-12/10-15 min</td>
<td>Y</td>
<td>DO, 16%, 100%</td>
<td>23%, 97%-100%</td>
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<td>Allen-DeBoer, Malmgren, and Glass (2006)</td>
<td>N = 4 &lt;br&gt;n = 4 EBD, other related mental disorders: ADHD, CD, D, PPD</td>
<td>1:1/pullout</td>
<td>16-18.2</td>
<td>NR</td>
<td>Multiple baseline across participants</td>
<td>T: Modified corrective reading/doctoral students</td>
<td>T: 22-37/30 min</td>
<td>N</td>
<td>DO, 18%, 100%</td>
<td>9.8SD, 100%* 97%-100%</td>
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### Table 1. (continued)

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<th>Agreement (S/IOA)</th>
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<tbody>
<tr>
<td>Strong, Wehby, Falk, and Lane (2004)</td>
<td>N = 6</td>
<td>T₁: Small-group/in-class (self-contained), T₂: Small-group/in-class (self-contained) and 2:1/pullout</td>
<td>12-14</td>
<td>7-8</td>
<td>Multiple baseline across dyads</td>
<td>T₁: Corrective Reading (CR) program/SPED Teacher; T₂: CR program + Repeated Reading (RR)/SPED teacher (CR) and research assistant (RR)</td>
<td>T₁: 28-60/CFD, T₂: 16-48/CFD/ T₁: 30-40 min, T₂: 30-40 min (CR) + 20-30 min (RR)</td>
<td>N</td>
<td>DO, NEI, 95%</td>
<td>35%, 89.8%-96.3%</td>
</tr>
<tr>
<td>Lingo, Slaton, and Jolivette (2006)</td>
<td>N = 7</td>
<td>1:1/in-class (resource room)</td>
<td>11.6-14.2</td>
<td>6-7</td>
<td>Multiple probe across participants</td>
<td>T: Corrective Reading program/SPED teachers</td>
<td>T: 5-21/45 min</td>
<td>Y</td>
<td>DO, 24%-37%, 96%-100%</td>
<td>21%-45%, 93%-100%</td>
</tr>
<tr>
<td>Scott and Shearer-Lingo (2002)</td>
<td>N = 3</td>
<td>1:1/in-class (self-contained)</td>
<td>NR</td>
<td>7</td>
<td>Multiple baseline across participants</td>
<td>T₁: Teach Your Child to Read in 100 Easy Lessons program/University Professor; T₂: Great Leaps Reading program/university professor, SPED teacher and instructional assistant</td>
<td>T₁: NEI, T₂: 5-19/10 min</td>
<td>N</td>
<td>SR, NR, 25%, 87%-99%</td>
<td></td>
</tr>
<tr>
<td>Sutherland and Snyder (2007)</td>
<td>N = 4</td>
<td>Dyads/in-class (self-contained)</td>
<td>11.4-13.6</td>
<td>NR</td>
<td>Multiple baseline across participants</td>
<td>T: Peer-mediated repeated reading + Self-graphing/SPED teacher (peer-mediated reading and self-graphing), and research assistant (self-graphing)</td>
<td>T: 9-19/20 min</td>
<td>Y</td>
<td>DO, 100%, 72.1%-100%</td>
<td>19%-39%, 86.1%-99.4%</td>
</tr>
</tbody>
</table>

Note. EBD = emotional and/or behavioral disorder; Y/M = years and months; M = treatment fidelity method; S = percentage of sessions; TA = percentage of treatment accuracy; IOA = percentage of interobserver agreement; MID = mild intellectual disability; NR = not reported in the study; SPED = special education; DO = direct observation; NEI = not enough information; AR = audio recording; ADHD = attention-deficit/hyperactivity disorder; ODD = oppositional defiant disorder; D = depression; LD = learning disability; CD = conduct disorder; PPD = pervasive personality disorder; CFD = calculated from data; SLI = speech language impairment; OHI = other health impairment; SR = self-reporting.

*Interobserver agreement for comprehension questions correct only.*
Table 2. Tau-U Effect Sizes Aggregated by Study and Dependent Variable.

<table>
<thead>
<tr>
<th>Study</th>
<th>Measure</th>
<th>Type</th>
<th>No. of contrasts</th>
<th>Tau-U</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alphabets and fluency outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Browder and Shear (1996; N = 3)</td>
<td>Overall</td>
<td>—</td>
<td>4</td>
<td>0.96*</td>
<td>[0.72, 1.00]</td>
</tr>
<tr>
<td></td>
<td>Sight-words correct</td>
<td>A/F</td>
<td>—</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unknown sight-words correct</td>
<td>A/F</td>
<td>—</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Words per minute</td>
<td>A/F</td>
<td>4</td>
<td>0.96*</td>
<td>[0.72, 1.00]</td>
</tr>
<tr>
<td></td>
<td>Errors per minute</td>
<td>A/F</td>
<td>—</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>Daly, Garbacz, Olson, Persampieri, and Ni</td>
<td>Overall</td>
<td>—</td>
<td>16</td>
<td>0.67*</td>
<td>[0.53, 0.82]</td>
</tr>
<tr>
<td>(2006; N = 2)</td>
<td>Words per 30 s</td>
<td>A/F</td>
<td>8</td>
<td>0.88*</td>
<td>[0.68, 1.00]</td>
</tr>
<tr>
<td></td>
<td>Errors per 30 s</td>
<td>A/F</td>
<td>8</td>
<td>0.45*</td>
<td>[0.24, 0.66]</td>
</tr>
<tr>
<td><strong>Comprehension outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blankenship, Ayres, and Langone (2005; N = 3)</td>
<td>Overall</td>
<td>—</td>
<td>18</td>
<td>1.00*</td>
<td>[0.82, 1.00]</td>
</tr>
<tr>
<td></td>
<td>Section quiz (percent correct)</td>
<td>C</td>
<td>9</td>
<td>1.00*</td>
<td>[0.64, 1.00]</td>
</tr>
<tr>
<td></td>
<td>Chapter quiz (percent correct)</td>
<td>C</td>
<td>9</td>
<td>1.00*</td>
<td>[0.80, 1.00]</td>
</tr>
<tr>
<td></td>
<td>Chapter test (percent correct)</td>
<td>C</td>
<td>—</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>Hale et al. (2005; N = 4)</td>
<td>Overall</td>
<td>—</td>
<td>16</td>
<td>0.46*</td>
<td>[0.33, 0.59]</td>
</tr>
<tr>
<td></td>
<td>Questions correct (mixed, multiple-choice)</td>
<td>C</td>
<td>8</td>
<td>0.23</td>
<td>[0.05, 0.41]</td>
</tr>
<tr>
<td></td>
<td>Rate of comprehension</td>
<td>C</td>
<td>8</td>
<td>0.71*</td>
<td>[0.52, 0.89]</td>
</tr>
<tr>
<td></td>
<td>Overall</td>
<td>—</td>
<td>12</td>
<td>0.71*</td>
<td>[0.56, 0.87]</td>
</tr>
<tr>
<td></td>
<td>Questions correct (fill in the blank)</td>
<td>C</td>
<td>8</td>
<td>0.91*</td>
<td>[0.78, 1.00]</td>
</tr>
<tr>
<td></td>
<td>Text map completion</td>
<td>C</td>
<td>4</td>
<td>0.11</td>
<td>[-0.17, 0.40]</td>
</tr>
<tr>
<td><strong>Combined reading outcomes</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alber-Morgan, Ramp, Anderson, and Martin</td>
<td>Overall</td>
<td>—</td>
<td>28</td>
<td>0.63*</td>
<td>[0.56, 0.71]</td>
</tr>
<tr>
<td>(2007; N = 4)</td>
<td>Words per minute</td>
<td>A/F</td>
<td>6</td>
<td>0.98*</td>
<td>[0.83, 1.00]</td>
</tr>
<tr>
<td></td>
<td>Errors per minute</td>
<td>A/F</td>
<td>8</td>
<td>0.39*</td>
<td>[0.25, 0.53]</td>
</tr>
<tr>
<td></td>
<td>Questions correct (factual, open-ended)</td>
<td>C</td>
<td>6</td>
<td>0.60*</td>
<td>[0.43, 0.76]</td>
</tr>
<tr>
<td></td>
<td>Questions correct (inferential, open-ended)</td>
<td>C</td>
<td>8</td>
<td>0.62*</td>
<td>[0.48, 0.77]</td>
</tr>
<tr>
<td>Allen-DeBoer, Malmgren, and Glass (2006; N = 4)</td>
<td>Overall</td>
<td>—</td>
<td>8</td>
<td>0.61*</td>
<td>[0.50, 0.71]</td>
</tr>
<tr>
<td></td>
<td>Words per minute</td>
<td>A/F</td>
<td>4</td>
<td>0.92*</td>
<td>[0.77, 1.00]</td>
</tr>
<tr>
<td></td>
<td>Errors per minute</td>
<td>A/F</td>
<td>4</td>
<td>0.30*</td>
<td>[0.15, 0.45]</td>
</tr>
<tr>
<td></td>
<td>GORT-3 rate</td>
<td>A/F</td>
<td>—</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GORT-3 accuracy</td>
<td>A/F</td>
<td>—</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GORT-3 passage score</td>
<td>C</td>
<td>—</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td></td>
<td>GORT-3 comprehension</td>
<td>C</td>
<td>—</td>
<td>a</td>
<td></td>
</tr>
</tbody>
</table>

(continued)
organizer phase, students (a) read independently a section of a chapter and made a graphic organizer of the read content, and (b) answered the chapter oral quiz. Pre–posttest measures were administered to the students across all chapters. The resulting overall Tau-\(U\) was 1.00 with a 95% CI = [.82, 1.00].
Hale et al. (2005) used an adapted alternating treatment design to evaluate three instructional strategies, listening, listening while reading, and silent reading. During the first intervention, listening, the interventionist read a passage aloud to the students. Afterward, the students were asked to answer comprehension questions. In the second intervention, listening while reading, the interventionist read a passage aloud while students read silently a copy of the passage and answered comprehension questions. Finally, in the control condition, independent silent reading, students silently read a passage and then answered comprehension questions. The resulting overall Tau-\(U\) was .46 with a 95% CI = [.33, .59].

Stone et al. (2008) used a multiple baseline design across participants to evaluate teacher- and student-generated text maps. During baseline, students read a story independently and then answered comprehension questions. During the first intervention phase, teacher-generated text map, the students (a) received instruction on the story components on the text map, (b) were read the title and introductory paragraph of a story, (c) generated potential questions related to the story, (d) orally read the rest of the story taking turns with the interventionist and filled in the appropriate elements in the text map, and (e) answered comprehension questions. During the second intervention phase, student-generated text map, students (a) received instruction on the story components to include in the text map, (b) read the title and introductory paragraph of a story, (c) composed story-related questions, (d) read the story independently and answered their text map questions, and (e) completed comprehension questions. The resulting improvements were reflected with an overall Tau-\(U\) of .71 with a 95% CI = [.56, .87].

Combined reading outcomes. Alber-Morgan et al. (2007) conducted a multiple baseline design across participants to evaluate repeated reading versus repeated reading plus prediction. During baseline, students read a passage orally and answered comprehension questions. During the repeated reading condition, students (a) read a passage aloud while receiving error correction procedures, (b) reviewed and practiced mispronounced and missed words assisted by the interventionist, (c) read the passage twice for 1-min each, and (d) answered comprehension questions. A second intervention condition focused on repeated reading plus prediction; here students (a) read the title of a reading passage and made a prediction of the story, (b) read the first two sentences and were asked to change their prediction if needed, (c) read the rest of the reading passage, (d) discussed the accuracy of their prediction with the interventionist, (e) read the passage twice for 1-min each, and (f) answered comprehension questions. The resulting overall Tau-\(U\) was .63 with a 95% CI = [.56, .71].
Allen-DeBoer et al. (2006) used a multiple baseline design across participants to evaluate the Corrective Reading curriculum (Engelmann, Hanner, & Johnson, 1999). During baseline, students received assistance on math worksheets and/or engaged in word games for 25 min and then completed a 1-min timed oral reading of a passage. The intervention condition focused on a modified version of the Corrective Reading program where students (a) received word-attack skills instruction for 10 min, (b) read a passage aloud and answered comprehension questions while reading for 15 min, and (c) performed a 1-min timed reading on a novel passage. The resulting overall Tau-U was .61 with a 95% CI = [.50, .71].

Strong et al. (2004) used a multiple baseline design across dyads to evaluate Corrective Reading versus a combination of Corrective Reading and repeated reading instruction. During the baseline phase, students (a) wrote in their journals, (b) received instruction on spelling words, (c) practiced the spelling words in a writing activity, and (d) read a story in a round-robin format. During the first intervention phase, Corrective Reading program, students (a) practiced word-attack strategies, (b) read a story as a group and orally answered comprehension questions, and (c) completed workbook exercises related to the story. In the second intervention phase, Corrective Reading program plus repeated reading, pairs of students (a) read a passage aloud together twice while receiving error correction by the interventionist, (b) read the passage aloud while their partner silently followed along and provided error correction, and (c) performed a timed reading of a novel passage. The resulting overall Tau-U was .65 with a 95% CI = [.54, .74].

Combined reading and behavior outcomes. Lingo et al. (2006) conducted a multiple probe design across participants to evaluate the Corrective Reading program. During baseline, students received a reading passage and scripted instructions to perform a 1-min oral reading of the passage. During the intervention phase, Corrective Reading instruction, the teacher implemented the Corrective Reading lesson. After the lesson, students received a reading passage and scripted instructions to read the passage orally for 1 min. Generalization probes were taken during baseline and intervention. Students were provided with a grade-level reading passage taken from the general education curriculum and scripted instruction to read the passage orally. Students’ behaviors in general and special education settings during reading activities were observed and recorded. The resulting overall Tau-U was .59 with a 95% CI = [.19, .98]. For improving appropriate behavior, a Tau-U of –0.15 with a 95% CI = [−.94, .65] was found.

Scott and Shearer-Lingo (2002) used a multiple baseline design across participants to evaluate two reading programs, Teach Your Child to Read in
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100 Easy Lessons (Engelmann, Haddox, & Bruner, 1986) and the Great Leaps Reading program (Campbell & Mercer, 1994). During baseline, students (a) read independently text from a textbook of their choice and (b) completed a comprehension worksheet. Students were redirected by the teacher when they exhibited disruptive or off-task behaviors. During the first intervention, Teach Your Child to Read in 100 Easy Lessons, students received instructional lessons as specified in the program. Instructional lessons included (a) phonics instruction and practice, (b) sentence reading, and (c) passage reading. In the second intervention condition, students received Great Leaps Reading instruction, which focuses on three reading areas: phonics, sight-word phrase reading, and short story reading. The lessons included a 1-min timed phonics, sight-word phrase reading, and short story reading probes with error correction procedures. In each of the three reading areas, students advance to the next level once they met an established mastery criterion. On-task behaviors were recorded on a weekly basis across conditions. The resulting overall Tau-U was .65 with a 95% CI = [.41, .89]. For improving on-task behavior, a Tau-U of .45 with a 95% CI = [-0.11, 1.00] was found.

Sutherland and Snyder (2007) used a multiple baseline design across participants to evaluate peer-mediated repeated reading with self-graphing. During the baseline phase, students worked independently on spelling and language arts activities. During the intervention condition, peer-tutoring (Peer-Assisted Learning Strategies [PALS]; Fuchs et al., 2001) plus self-graphing, students worked in pairs and took turns to (a) read a passage for 5 min (“partner reading”), (b) read a paragraph and summarize the main idea (“paragraph shrinking”), and (c) make predictions (“prediction relay”) in the text. All three stages included error correction procedures. Students’ disruptive behaviors were observed and recorded across all sessions. Each student on a weekly basis charted his or her reading performance data. The resulting overall Tau-U was .33 with a 95% CI = [.25, .41]. A Tau-U of .23 with a 95% CI = [.10, .36] was found for disruptive behaviors per minute. In addition, for active responding, a Tau-U of .30 with a 95% CI = [.17, .43] was noted.

Discussion

This review summarized findings from 11 SCR studies identified from a comprehensive search of the literature focused on students with or characterized as at-risk for EBD. The review focused on middle and secondary students because reading interventions with older students with EBD is lacking (Lane & Carter, 2006; Wehby, Lane, & Falk, 2003). First, overall positive effects were found for the reading interventions included in the review;
however, results varied depending on the intervention studied and dependent variable measured. An omnibus effect size of .59 with a 95% CI = [.54, .64] across studies was obtained. When considering the confidence intervals and effect size ranges found in this review, this effect size would be interpreted as a moderate effect size. However, consideration should be given to the range of effect sizes was found for individual studies. For example, the lowest effect size reported was by Sutherland and Snyder (2007), who implemented peer-mediated repeated reading with self-graphing (i.e., Tau-U of .33). The largest effect size was found for Blankenship et al. (2005), who examined student-generated graphic organizers (i.e., Tau-U of 1.00). Moreover, within a given study, a particular intervention could have both strong and weak effects depending on the dependent measure. For example, Lingo et al. (2006) implemented Corrective Reading and found a strong effect for words read correctly (i.e., Tau-U of .85) but a small effect for improvements in appropriate behaviors (i.e., Tau-U of –.15). The pattern of lower effect sizes was illustrated in the three studies that included behavior outcomes (Lingo et al., 2006; Scott & Shearer-Lingo, 2002; Sutherland & Snyder, 2007). Each tended to have small to modest effects and were generally lower than the reading outcome measures.

Second, most measures found in this review were primarily researcher-developed proximal measures of reading, especially those that measured comprehension. This is not surprising, as SCR designs are focused on using proximal measures to demonstrate functional relationships (Horner et al., 2005). Interestingly, this finding is similar to the results of research reported in the LD literature. For example, Solis et al. (2012) reviewed 14 studies examining reading comprehension interventions at the middle school level (Grades 6-8) for students with LD published between 1979 and 2009. Twelve studies used treatment and comparison designs; 2 used SCR designs. The authors found that few studies reported standardized measures for which they found moderate effect sizes. Instead, the majority of studies included researcher-developed comprehension measures that yielded much larger effects.

Third, one of the striking aspects of this review was that few studies implemented behavioral supports along with the reading intervention to address problem behavior. This is an important component of the intervention for students with EBD. Some students with EBD have academic profiles similar to students with LD (Vaughn et al., 2002). However, because problem behavior is a factor for nonresponse to intervention (Al Otaiba & Fuchs, 2006), it seems prudent to implement multicomponent interventions that include both academic and behavioral supports for assisting these students in overcoming potentially aversive curricular tasks (Gunter, Hummell, &
Conroy, 1998; Shores, Gunter, & Jack, 1993). Evaluating multicomponent interventions that integrate behavioral interventions with reading instruction to address both the academic as well as the behavioral deficits of students with EBD is a gap in the literature that should be addressed.

Fourth, studies included in the review reflected a lack of concurrent behavioral outcome measures. Research suggests there is a relationship between academic failure and problem behavior (McEvoy & Welker, 2000). The determination of any collateral effects that academic interventions have on problem behavior would be an important finding (Wanzek, Vaughn, Kim, & Cavanaugh, 2006). In this review, only three studies included behavioral outcome measures. One study (Lingo et al., 2006) included a measure of percentage of intervals with appropriate behaviors. Scott and Shearer-Lingo (2002) focused on percentage of intervals on-task, while another study (Sutherland & Snyder, 2007) focused on active responding and rate of disruptive behaviors per minute as a behavioral outcome. However, most studies did not measure the collateral effects, if any, of the reading intervention on problem behavior or social-behavioral functioning.

Limitations

There are several limitations of the current review. The number of studies was insufficient for conducting a moderator analysis as done in other quantitative reviews of the literature (i.e., meta-analysis). At this point, the research base for middle/secondary reading interventions for students with EBD is underdeveloped. As more interventions are empirically verified and replicated through SCR designs, more consideration can be given to moderators of reading outcomes for students with EBD. Moreover, the description of either the behavioral or learning characteristics of the students included in many of the studies was insufficient. Students with EBD demonstrate a complex set of learner characteristics that impact academic and behavioral outcomes, such as externalizing and internalizing problems as well as comorbid mental health problems (e.g., attention-deficit/hyperactivity disorder). These emotional and/or behavioral problems are not often described in detail. Likewise, comorbid learning problems, whether they stem from a diagnosed LD or originate from more “garden variety” poor reading skills, are not often well described, making it difficult to understand what reading interventions work best with what subgroups of students with EBD. In addition, several studies included pre–posttest measures that generally showed improved outcomes. However, there were not sufficient data to calculate an effect size for these outcomes. Thus, only the repeated measures are reported from the studies included in our review. Last, because the focus was on SCR, group designs were excluded from inclusion in the review.
Implications for Practice

The current review provides initial guidance from the SCR literature on empirically supported interventions for students with EBD at the middle/secondary level. Research from longitudinal studies has demonstrated that the behavioral and academic trajectories of younger students with EBD will not change without intensive intervention (Montague, Enders, & Castro, 2005). Likewise, it is unlikely that students with or at-risk for EBD who have both reading and behavior problems will improve without intensive reading instruction combined with the appropriate behavior supports. Older students, in particular, with severe reading deficits require intensive reading intervention to gain the necessary skills to comprehend the content laden text at the middle and secondary levels (Biancarosa & Snow, 2006). Without scientifically validated reading instruction coupled with evidence-based behavioral interventions, students with EBD will continue to struggle with poor reading skills. This, in turn, will adversely impact their behavioral and overall academic outcomes, including increasing the drop-out rates and continued aversiveness of curricular tasks involving reading (Gunter et al., 1998; Shores et al., 1993). This review of the literature revealed several fluency-based and comprehension-oriented interventions that showed improved outcomes, including modified direct instruction (Allen-DeBoer et al., 2006; Lingo et al., 2006), repeated readings (Alber-Morgan et al., 2007), and text comprehension (Blankenship et al., 2005). These interventions and others reviewed hold promise for improving the reading outcomes of students with EBD, but more research is needed to understand how to contextualize effective reading practices to this population.

Implications for Future Research

This review provides ample justification for the need for additional research focused on improving the reading outcomes of students with EBD at the middle and secondary level. Other reviews in the general reading and LD literature have identified promising reading interventions for improving outcomes (Solis et al., 2012). However, this research has not been replicated and applied within the EBD research literature. This gap in the research literature is salient for middle/secondary students generally, and students with EBD in particular (Lane & Carter, 2006). As Kauffman (2010) noted,

We need more studies of (a) how to teach academic skills more effectively, (b) how to teach behavioral skills more effectively, (c) how behavioral and academic skills are interrelated, and (d) how to choose those students who require a specific level of instruction. (p. 183)
This statement is particularly applicable to middle and secondary students with EBD in the area of reading instruction. Currently, the field of special education is focused on identifying evidence-based interventions to improve reading outcomes. Given their negative academic outcomes, it is of critical importance that research in the area of reading is extended to students with EBD.

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**References**

*Asterisk indicates articles included in review.*


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