

Academic and Behavior Combined Support:**Evaluation of an Integrated Supplemental Intervention for Early Elementary Students**

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Abstract

In current multi-tier models, students who are not responsive to universal instruction receive supplementary support. Despite most students having co-occurring academic and behavior challenges, their needs are typically addressed through separate academic or behavior interventions. This approach is not only costly for schools, it also fails to acknowledge the well-documented link between behavior and academic performance. The purpose of this study was to evaluate *Academic and Behavior Combined Support (ABC Support)*, a newly developed supplemental intervention that merges a combined focus on reading fluency and engagement. Six teachers implemented the intervention for 6-8 weeks with Grade 2 students. Students' oral fluency on standard and training reading passages and occurrence of engagement and disruptive behaviors during reading instruction were measured repeatedly across baseline and intervention phases in a multiple baseline design. Visual and statistical analyses revealed significant improvement from baseline to intervention for both reading and behavior outcomes. Theoretical and empirical contributions as well as practice implications are addressed.

Keywords: integrated intervention, supplemental support, oral reading fluency, engagement

Academic and Behavior Combined Support:

Evaluation of an Integrated Supplemental Intervention for Early Elementary Students

Schools are tasked with dual goals of promoting academic success and supporting positive behavior development. In multi-tiered models of service delivery, students who fail to meet grade-level academic or behavior expectations receive supplementary support. Although students who require Tier 2 support often have co-occurring academic and behavior challenges, their needs are typically addressed through separate academic or behavior interventions (Tackett et al., 2009). This approach is not only costly for schools, it also fails to acknowledge the inextricable link between behavior and academic performance (McIntosh et al., 2008; Miles & Stipek, 2006; Welsh et al., 2001).

In recent years, schools have focused on blending academic Response to Intervention (RTI) with Positive Behavioral Interventions and Support (PBIS; McIntosh & Goodman, 2016). The aim of blended RTI and PBIS approaches, or integrated multi-tiered systems of support (MTSS), is to provide universal academic and behavior support for all students in an integrated manner (Algozzine & Algozzine, 2009; McIntosh et al., 2006; Noltemeyer & Sansosti, 2012). McIntosh and Goodman emphasize that integrated MTSS “is not simply implementing both academic RTI and PBIS systems. There is a systematic and careful integration of these systems to enhance the efficiency and effectiveness of all school systems” (p. 6).

Integrated approaches at the universal level have proven to be effective in supporting behavioral and academic competence. McIntosh et al. (2006), for example, found higher academic skill performance and fewer disciplinary referrals in schools that implemented school-wide positive behavior support embedded within high-quality core academic instruction. According to these researchers, reducing problem behavior through positive behavior support

makes responding to reading instruction more likely, while improving reading skills through research-based reading instruction improves engagement and enhances social adjustment.

Bradshaw et al. (2009) examined the long-term educational outcomes associated with an integrated “classroom-centered” (CC) program designed to promote early learning skills and behavior competence in Grade 1. The CC program combines a universal, evidence-based behavior intervention (*Good Behavior Game*; Embry, 2002) with a prescribed set of curriculum enhancements and teaching strategies designed to strengthen academic responding (*Dialogic Reading* [Whitehurst et al., 1994] and *Directed Reading-Thinking Activity* [Stauffer, 1969]). Bradshaw et al. found substantial benefits for multiple outcomes (e.g., achievement, reduced special education participation). They concluded that the behavior component of the intervention provided students with a greater opportunity to learn by reducing off-task and disruptive behavior, while the academic component enhanced their academic skills.

In other research, Domitrovich et al. (2010) described the development and implementation of an integrated Tier 1 approach called P2P, which combined two interventions: (a) *Promoting Alternative Thinking Strategies* (PATHS; Kusche & Greenberg, 1994), a social-emotional curriculum to improve friendship skills, understanding and expression of emotions, and problem-solving ability; and (b) an adaptation of the *Good Behavior Game* (PAX-GBG; Embry et al., 2003), a group-contingency token economy aimed at reducing disruptive and off-task behavior. Domitrovich et al. found that the blending of two evidence-based interventions within P2P had multiplicative positive effects on students’ social-emotional and behavior outcomes. Specifically, the PATHS curriculum provided explicit instruction and supported goal setting, while the PAX-GBG created opportunities for students to be reinforced for displaying appropriate behaviors.

Despite significant progress toward merging academic and behavior supports within Tier 1 systems, a combined academic-behavior focus has yet to be extended to supplemental interventions. In current practice, Tier 2 interventions typically address academic or behavior problems independently, most often using separate procedures to treat and monitor either achievement or behavior outcomes (Stewart et al., 2007; Sugai et al., 2000; Tackett et al., 2009). To date, the benefit of a merged focus on both academic skills and behavior within a single, integrated Tier 2 intervention has not been evaluated. To address this research and practice void, the current authors developed and conducted a preliminary evaluation of an intervention called *Academic and Behavior Combined Support (ABC Support)*. *ABC Support* is an integrated, supplemental intervention for early elementary students that merges a combined focus on developing reading fluency and strengthening positive behaviors (engagement and compliance).

Conceptualization of Integrated Interventions

Integrated interventions result from “the fusing of independent strategies or programs into one enhanced, coherent intervention approach” (Domitrovich et al., 2010, p. 74). An important benefit of integrated interventions is their potential for synergistic effects (Nelson et al., 2002; Reinke et al., 2012). Integrated academic and behavior interventions are often more powerful than separate, single-focus approaches because the complementary “active ingredients” interact synergistically (Cook et al., 2012; Kuchle et al., 2015). For example, a single-focus behavior intervention may incorporate reinforcement procedures and yet lack opportunities to practice new behaviors in the context of learning tasks. When merged with an academic intervention, opportunities to practice academic skills complement the reinforcement strategies of the behavior intervention. Similarly, the effectiveness of an academic intervention may be undermined by students’ noncompliant or inattentive behavior. When merged with a behavior

intervention to minimize challenging behavior, the effective use of reading time is maximized.

Integrated interventions are different than sequential (“stacked”) or simultaneous (“parallel”) interventions. Sequential implementation of two discrete interventions occurs when a reading intervention is followed by a behavior intervention, or vice versa. Simultaneous implementation of two separate interventions occurs when there is parallel implementation of one intervention to strengthen academic skills and another to support positive behavior. Unlike sequential or simultaneous approaches, integrated interventions retain the unique strategies of each separate intervention, while merging their common elements, such as a high level of contingent praise or performance feedback (Chorpita et al., 2007; Daunic et al., 2013; McIntosh & Goodman, 2016). Neither sequential nor simultaneous interventions take advantage of the natural link between academic performance and behavior; and, they fail to build on the common, shared features of effective academic and behavior interventions.

Rationale for Integrated Supplemental Interventions

The repertoire of academic and behavior interventions with research support has increased in recent years (Burns et al., 2012; Stormont et al., 2012). Given the number of effective single-focus interventions, why is an integrated approach needed? This question can be addressed from both an empirical and efficiency perspective.

Empirical Rationale

The empirical rationale for integrated interventions derives from more than five decades of research demonstrating a strong link between behavior and academic performance (Algozzine et al., 2011; Benner et al., 2005; Bennett et al., 2003; Metcalfe et al., 2013; Morgan et al., 2008). According to Walker et al. (2004), “academic achievement and behavior reinforce each other. Experiencing success academically is related to decreases in acting out; conversely, learning

positive behaviors is related to doing better academically” (p. 10). In fact, studies suggest that behavior problems co-occur with academic concerns approximately 50% to 80% of the time (Fessler et al., 1991; Kuchle et al., 2015). The academic-behavior connection is strongest between reading and inattentive or disruptive behavior (Walker et al., 2004). Moreover, the connection becomes stronger as students advance through school (Benner et al., 2005).

The well-documented link between students’ academic skills and behavior occurs as early as kindergarten. Young learners with reading difficulties may engage in disruptive behavior to avoid reading activities, which, in turn, limits their access to instruction and opportunities to learn (Metcalf et al., 2013; Welsh et al., 2001). Not surprisingly, students’ difficulties in one domain (reading or behavior) are highly predictive of problems in the other domain. Children with reading problems in Grade 1 are likely to display behavior problems in Grade 3; similarly, children who are disruptive and poorly engaged in Grade 1 are at risk for reading problems in Grade 3 (Bennett et al., 2003; Juel, 1988; Morgan et al., 2008). This negative spiral of achievement and behavior puts students at high risk for long-term negative outcomes, including school dropout and juvenile delinquency (Gray et al., 2014; Miles & Stipek, 2006).

Efficiency Rationale

The efficiency rationale stems from the potential for maximizing cost-effective uses of time, personnel, and resources in schools through integrated interventions. Well-designed integrated interventions maintain the unique strategies of each separate intervention, while merging their common elements (McIntosh & Goodman, 2016). Combining academic and behavior supports within an integrated approach neither compromises integrity nor undermines the benefits of a single-focus strategy (Algozzine & Algozzine, 2009). Although effectiveness research with integrated interventions is lacking, there is evidence that sequential models of

academic and behavior support produce larger gains in academic and behavior outcomes compared to single-focus models (McIntosh et al., 2006; Stewart et al., 2007).

Integrated interventions may also reduce system overload, minimize costs in terms of time and resources, and enhance sustainability and generalization. When interventions operate in isolation, there is often limited buy-in; insufficient training, professional development, and system-level support; and low fidelity of implementation. Consequently, interventions are more likely to be discontinued over time. Merging a focus on behavior and academic skills into one intervention to be implemented during a single intervention block or time period is efficient and cost-effective in that it reduces the resource burden associated with implementing separate academic and behavior interventions (Ervin et al., 2006; Kuchle et al., 2015). Finally, integrated interventions are in the best interests of students. To provide separate interventions for students with academic and behavior problems, either the dosage for each intervention may need to be reduced to fit a standard intervention period, or schools are forced to prioritize one domain over the other and deliver interventions sequentially. Neither option is optimal for promoting students' success in school (Domitrovich et al., 2010; Kuchle et al., 2015).

Theoretical Foundation for Integrated Interventions

A reciprocal-deficit pathway (RDP) theory, which is often invoked to explain the link between behavior and academic learning, provides the theoretical foundation for integrated interventions. According to RDP theory (depicted in Figure 1), development of academic skills and behavior competence are intertwined, such that as one changes, so does the other. Academic and behavior problems are inextricably related over time, leading to a “negative feedback cycle” of escalating problem behavior and academic failure, or what researchers call a “continuous cycle of educational failure” (Hoffman, 2018; Morgan et al., 2008).

Research linking academic skill deficits with disruptive behavior is most often framed within this RDP perspective. Students who exhibit disruptive behaviors typically display low attention, receive less instructional time and have fewer opportunities to learn, which may contribute to low academic success; academic failure, in turn, may lead to further negative interactions with teachers, low engagement, and disruptive behaviors. This cycle of problem behavior leading to academic failure and academic failure leading to problem behavior begins in the early grades and becomes difficult to break as children progress through school (Hoffman, 2018; Metcalfe, et al., 2013).

As shown in Figure 1, some children *[A]* enter school with low academic skills and fail to respond to instruction because they lack prerequisite skills. Their access to praise and recognition for academic success is reduced. Over time, they fall behind and develop patterns of low engagement and disruptive behavior that further restrict their likelihood of success. Alternately, some children *[B]* enter school with challenging behaviors that restrict the quantity and quality of instruction they receive. They are unable to access effective teaching to acquire academic skills. Within the RDP framework in Figure 1, integrated academic and behavior interventions are conceptualized as having simultaneous intervention entry points at *[A]* and *[B]*, thereby maximizing both academic and behavior outcomes.

Based on RDP theory, integrated approaches have the advantage of merging two function-based interventions to address both escape- and attention-maintained behaviors. Referring to Figure 1, for children who enter school with low academic skills *[A]*, non-compliance and disengagement allow them to avoid (“escape from”) difficult academic tasks; these escape-maintained behaviors are strengthened over time (Filter & Horner, 2009; Geiger et al., 2010). Alternatively, for children who enter school with challenging behaviors *[B]*, non-

compliance and disengagement lead to receiving teacher attention (e.g., reprimands) or peer attention (e.g., giggling); in this manner, these attention-maintained behaviors may be strengthened over time (Carr et al., 2009). In an integrated framework, interventions address both escape-maintained and attention-maintained challenging behavior by simultaneously (a) bolstering academic skills and, thereby, minimizing the difficulty of academic tasks, and (b) providing teacher attention and interactions that support positive or desired behaviors.

Development of Academic Behavior Combined (ABC) Support

Based on the foregoing empirical, efficiency, and theoretical rationales, the current authors developed an integrated supplemental intervention, called *ABC Support*, that merges shared and unique elements of separate academic and behavior interventions. The development of *ABC Support* was funded through a three-year grant from the Institute of Education Sciences and resulted from an iterative process incorporating three distinct phases leading to an experimental evaluation reported here. The first phase required an extensive research review of evidence-based interventions that target learning-related behaviors and reading fluency for early elementary students, with the objective to delineate both shared and unique elements of effective interventions. The second phase involved collaboration with a group of 14 “end users” (e.g., teachers, interventionists) to translate evidence-based elements into integrated intervention procedures and materials designed to facilitate implementation. The final phase consisted of a series of feasibility trials during which school-based interventionists received training and ongoing coaching to “try out” *ABC Support* and, then, provided evaluative feedback.

The design of *ABC Support* was guided by a model developed by the authors for intervention integration. The integration model included three steps.

Step 1: Determine Target Skills and Grade Levels

The first step was to determine the academic skills and grade levels to be targeted by the intervention. *ABC Support* specifically focuses on academic skills and behaviors that put students at risk for low school success – namely, reading fluency and engagement. Many elementary students with reading problems have poor reading fluency; they have difficulty reading connected text with enough accuracy and speed for good comprehension (Chard et al., 2002). Despite its importance for reading success, fluency is often neglected in universal reading instruction (Fuchs et al., 2001). A national survey found that 40% of students in Grades 1-3 are “non-fluent” readers and require supplemental instruction to develop fluency (Daane et al., 2005). Similarly, the extent to which students are engaged or, conversely, exhibit disruptive behavior affects their learning outcomes. It is estimated that 30% of students exhibit low engagement to the degree that it interferes with their ability to learn (Campbell et al., 2013). Our decision to focus on reading fluency and engagement is further supported by evidence that the academic-behavior link is strongest for these two skill areas (Lassen et al., 2006).

Whereas integrated academic-behavior interventions may be implemented for students across all grade levels, *ABC Support* specifically targets early elementary students. This focus on Grades 1-3 is supported by research documenting the critical need for early intervention. The longer academic and behavior problems persist, for example, the less likely interventions will be effective (Anderson & Borgmeier, 2010). Students who are not reading at grade level by Grade 4 have a low probability of becoming proficient readers; likewise, challenging behavior patterns that do not improve by the end of Grade 3 often become chronic and difficult to remediate (Juel, 1988; Walker et al., 1996; Welsh et al., 2001). *ABC Support* is aimed at providing early intervention to avert more severe, long-term academic or behavior challenges.

In sum, early elementary students (Grade 3 and below) who fall below grade-level benchmarks for reading fluency and engagement are most likely to benefit from *ABC Support*. Given the intentional focus on reading fluency, students who lack proficiency in pre-reading skills (alphabet knowledge and/or phonemic awareness) are not likely to benefit from *ABC Support*. Likewise, students who are fluent readers but demonstrate deficiencies in vocabulary knowledge or comprehension skills may not benefit directly from *ABC Support* (unless weak comprehension is due to limited fluency; Levin, 1972). In terms of behavior deficiencies, given the focus on engagement and compliance, *ABC Support* benefits students who demonstrate challenges in these learning-related behaviors. Students with internalizing behaviors (e.g., social withdrawal) or severe externalizing behaviors (e.g., aggression) are not likely to have their needs addressed through *ABC Support*.

Step 2: Delineate Research-Supported Intervention Elements

The second step was to identify evidence-based intervention elements across both academic and behavior interventions. Academic and behavior interventions often incorporate similar intervention elements. According to Chorpita et al. (2007), common elements are overlapping treatment components across effective interventions that target different domains – in the case of *ABC Support*, reading fluency and engagement. Chorpita et al.’s “common-elements” approach allows for the distillation of “evidence-based kernels” across academic and behavior interventions. Delineating these shared elements is central to intervention integration. Over a nine-month period, the authors conducted a thorough review of multiple data sources and identified 12 evidence-based elements across effective reading fluency and/or behavior interventions. Table 1 lists the 12 intervention elements, explains the application of each element in the context of *ABC Support*, and summarizes the key “take-away” research conclusions for

each element in the table. *ABC Support* is structured to ensure that all elements are clearly present within the intervention procedures to simultaneously support the development of oral reading fluency and learning-related engagement behaviors. For example, an integrated set of reading and behavior expectations is taught using the acronym READ (Read carefully; Enthusiasm and excitement in voice; Attention and positive attitude; Do best reading and behavior). These expectations are demonstrated by the teacher and practiced by the student. In addition, students receive feedback and praise for both reading and behavior, and they graph their reading and behavior performance over time. The integration process resulted in the application of all intervention elements in *ABC Support*, as summarized in Table 1.

Step 3: Incorporate a Balance of Shared and Single-Focus Intervention Elements

The final step was to balance the elements shared across both academic and behavior interventions (e.g., goal setting) with critical elements of each single-focus intervention. The aim of academic-behavior integration is to enhance the effectiveness and efficiency of single-focus interventions by developing or adapting practices to provide combined support, without diminishing the benefit of a single-focus academic or behavior intervention. Integration involves connecting behavior expectations to academic skill learning and, simultaneously, linking academic skill acquisition to engaging in appropriate behaviors.

The key to integration is to derive a balance of (a) shared elements of effective interventions (academic or behavior) with (b) explicit single-focus strategies necessary to support development of a specific academic skill or behavioral competence. Certain elements may be necessary to ensure the effectiveness of a single-focus intervention. In the case of *ABC Support*, for example, word-error correction is an evidence-based element of reading fluency interventions, but not behavior interventions. Eliminating or modifying word-error correction to

achieve integration would likely undermine the effectiveness of the reading intervention. This balance of shared and single-focus strategies is depicted in Figure 2. The goal of integration is to extract and adapt, as necessary, the common intervention elements to provide both academic and behavior support (shared elements), while preserving or maintaining the integrity of practices that are essential for the effectiveness of each single-focus intervention (explicit skill strategies).

Purpose of Study

In sum, research provides evidence that universal integrated academic and behavior systems are effective in promoting student success (McIntosh & Goodman, 2016). The question remains, however, whether integrated Tier 2 interventions will yield comparable benefits for students who, based on screening, have academic and behavior challenges that limit their responsiveness to Tier 1 approaches. The current study was designed to address this question.

In our theory of change (Figure 3), the common intervention elements shared across effective reading fluency and behavior interventions are integrated into *ABC Support*. Three predictions were derived from our theory of change. First, we predicted that implementation of the evidence-based intervention elements will have a positive effect on academic and behavior intervention (proximal) outcomes, specifically reading fluency on training passages (number of words read correctly in one minute) and occurrence of learning-related engagement behaviors (e.g., paying attention). Second, we predicted that students' use of the *ABC Support* self-checklist to monitor their performance during regular reading instruction (through teacher prompts) will facilitate generalization of reading and behavior expectations from the treatment to non-treatment classroom setting. Finally, we predicted that strengthening reading fluency and engagement during intervention sessions, combined with generalizing reading and behavior

expectations to the classroom setting, will improve reading fluency on non-training passages (words read correctly in one minute) and behaviors (percentage of occurrence of engagement and disruptive behavior) during universal classroom reading instruction (distal outcomes).

Method

Teacher Participants and Training

Six teacher-student dyads participated in the study. Figure 4 summarizes the recruitment and participation rates for teacher participants. First, administrators for 16 school districts in south central Wisconsin who reported implementing MTSS were contacted to request permission to recruit teachers for participation. Of these, five (31%) initially agreed to participate; however, one district withdrew prior to the initiation of the study. In the four remaining districts, building principals for five of the eight existing elementary schools (62.5%) agreed to participate. Across all schools, 26 teachers who taught second-grade students were invited to participate. Of these, eight (31%) initially consented to participate. One teacher withdrew from participation due to personal time restrictions. Another teacher implemented the study procedures; however, her student refused to participate in the outcome assessment. This circumstance resulted in six teacher-student dyads for the intervention portion of the study, with one additional teacher who provided pre- and posttest assessments on outcome measures. Due to COVID-19, schools closed prior to completion of the intervention phase, resulting in four teachers being able to implement *ABC Support* for 8 consecutive weeks (the planned implementation period), one teacher implementing the intervention for 7 weeks, and another implementing for 6 weeks.

Table 2 provides a summary of the characteristics of teachers and English Language Arts classrooms. Near the beginning of the school year, members of the research team conducted an informational session with teachers to obtain signed consent, gather information about classroom

schedules and routines, review student recruitment and screening procedures, and schedule training sessions. Two on-site, teacher-training sessions (one week apart) occurred within the following 2-3 months, prior to the initiation of data collection. During training, teachers received a procedural manual and all intervention materials. The 60-minute training sessions included an explanation and detailed “walk-through” of *ABC Support* intervention implementation, with video demonstrations of each procedural step. Teachers received periodic implementation fidelity checks and on-site coaching from the research team throughout the intervention period. All teacher training, implementation fidelity checks, and coaching procedures were semi-scripted and implemented according to a training and coaching manual (available online at <https://projects.wcer.wisc.edu/abcsupport>).

Student Participants

One student for each teacher was selected to participate using a four-step process:

1. Teachers and staff of participating schools used the school’s standard reading and behavior screening procedures to identify 27 prospective students for the *ABC Support* intervention. All students fell below their school’s benchmark cut-offs for behavior and reading.
2. Parents of school-identified students received consent information requesting permission for the research team to conduct further screening of their student for possible participation in *ABC Support*. Parents of 18 students (67%) provided consent.
3. Students with parent consent participated in two standard screening procedures (see **Measurement** section) to determine their eligibility to participate in *ABC Support*. Students were eligible to participate if their scores on the reading fluency and behavior screening measures fell at or below the risk cut-off. Eight students (44% of all screened students) met

the criteria for participation. In one classroom, two students met the criteria; therefore, one student was selected at random to participate.

4. Each of the seven eligible students gave oral assent for participation. As noted previously, one student withdrew his assent to participate in outcome assessment. This withdrawal resulted in having complete data for six (4 boys and 2 girls) students. All student participants were in Grade 2; four students were White, and two were Black.

Measurement

The measurement plan involved the use of multiple procedures to assess reading fluency and learning-related behaviors (engagement and disruptiveness). Measures were administered prior to, during, and following teachers' implementation of the *ABC Support* intervention.

Student Screening

A standard screening process integrating both behavior and reading fluency measures was conducted to select students for *ABC Support*. Each participating school utilized different universal screening measures to identify at-risk students who required supplemental reading and/or behavior interventions. Therefore, the use of follow-up, standard screening measures ensured a comparable level of risk across all participants.

Behavior screening. Teachers completed a behavior screening tool that included two measures: (a) *Social, Academic, and Emotional Behavior Risk Screener* (SAEBRS; Kilgus et al., 2014), and (b) *Engagement with Learning: Teacher Report Scale* (EWL; Skinner et al., 2009). The SAEBRS is comprised of 19 items corresponding to social (9 items), academic (6 items) and emotional (7 items) behaviors that predict school success. On the SAEBRS, teachers rate students by indicating how frequently they have displayed each of 19 behaviors during the previous month. Item ratings range from 0 (never) to 3 (almost always). Total scores range from

0 to 57, with higher scores indicative of more appropriate functioning. Students with SAEBRS scores at or below the cut points for risk were eligible to participate in *ABC Support*, specifically ≤ 36 for Total Behavior, ≤ 17 for Emotional Behavior, ≤ 9 for Academic Behavior, and ≤ 12 for Social Behavior.

The EWL focuses more narrowly on student engagement (behavioral and emotional). On the EWL, teachers rate students by indicating how frequently 10 statements about behavioral engagement (e.g., “When I explain new material, this student listens carefully.”) and emotional engagement (e.g., “When reading, this student seems to enjoy it.”) are true for the student. Like the SAEBRS, item ratings on the EWL range from 0 (never) to 3 (almost always). Total scores range from 0 to 30, with higher scores indicative of a higher level of engagement. Students with EWL scores at or below the cut point for risk (≤ 15) were eligible to participate.

Reading fluency screening. Concurrent with the behavior screening, members of the research team administered oral reading fluency (ORF) screening passages from the *Dynamic Indicators of Basic Early Literacy Skills® Next* (DIBELS; Good et al., 2011) to each prospective student. On the DIBELS, students read aloud three grade-level passages for one minute, while the examiner recorded reading errors to determine the number of words correct per minute (WCPM). Students were eligible to participate if their reading fluency scores were below the Grade 2 fall benchmark score (median WCPM ≤ 53).

Outcome Assessment

Outcome assessment included both direct and indirect measures of reading fluency and learning-related classroom behavior. Assessment occurred continuously and repeatedly (1-2 times per week) throughout the study period in a single-case, multiple-baseline observation format (see, for example, Kratochwill & Levin, 2014)

Classroom behavior. An adaptation of the *Direct Behavior Rating* (DBR; Chafouleas et al., 2009) procedure was used to conduct classroom observations and to code the occurrence of engagement and disruptive behaviors during universal reading instruction. Trained data collectors, who were “blind” to the experimental phase, completed DBRs 1-2 times weekly across the study period. For each observation, data collectors rated the occurrence (percentage of time) of two operationally defined target behaviors (engaged behavior and disruptive behavior) within a 20-minute period. Each 20-minute period was divided into shorter observation intervals (≤ 5 minutes), the length of which was determined by a shift in the instructional format (independent work, small group, or large group). At the end of each observation period, data collectors also (a) rated five specific engagement behaviors (e.g., “Did the student pay attention?”) using a 3-point scale, and (b) provided 2-3 narrative comments regarding the student’s behavior and/or classroom instruction. Three types of information were derived from each observation: (a) average percentage of occurrence of engaged behavior and disruptive behavior (0% to 100%); (b) average item ratings (1.0 to 3.0) for each engagement behavior; and (c) narrative data regarding student behavior and/or classroom reading instruction. All observation recording forms were checked for accuracy in calculating percentage of occurrence.

Passage reading. Oral reading fluency (ORF) probes were used to assess students’ reading proficiency. We used two types of probes: (a) standard Grade 2 reading passages from the DIBELS to assess generalization of reading fluency skills to non-training passages, and (b) training passages (used for repeated practice during intervention sessions) to assess short-term maintenance of reading fluency skills on trained materials.

Trained data collectors, who were “blind” to the experimental phase, administered ORF passages 1-2 times weekly to participating students. For each assessment, the student read a

grade-appropriate DIBELS (standard) passage for one minute. Assessors recorded reading errors on a separate copy of the passage while the student read aloud. The student also read a training passage for one minute. The training passage had been used for repeated reading practice during an intervention session occurring 3-5 days prior to the assessment. The order in which standard and training passages were read was counterbalanced across assessment sessions. For consistency across training sessions and outcome assessment, the directions for administering and scoring standard passages were the same as the directions for administering and scoring training passages. For both standard and training passages, the fluency score was the number of words correct per minute (WCPM, i.e., number of words read in one minute minus the number of errors). All recording forms were double scored to ensure accuracy in the calculation of scores.

Reliability of outcome measurement. A group of nine trained data collectors (graduate and undergraduate students) completed all outcome assessment procedures. Data collectors participated in at least one structured training session conducted by members of the research team, who also served as master coders. The training included an explanation, demonstration, and practice implementation and scoring of both outcome procedures. Following the training session, data collectors underwent an individual certification process during which they independently scored ORF passages and coded videotaped classroom behaviors. Once data collectors achieved a criterion level of agreement with the master coder ($\geq 90\%$ agreement), they were certified to implement the assessment procedures.

Data collectors were “blind” to the experimental phase and assigned randomly to conduct assessment sessions with individual students (ORF probe administration and classroom observation). Four student participants were assessed by all data collectors, and two students were assessed by eight (of nine) data collectors. Inter-rater reliability (IRR; agreement with

master coder) was assessed periodically for 20%-25% of each data collector's assessment sessions (20.7% of assessment sessions across all data collectors). If agreement with the master coder fell below 80%, data collectors received additional "booster" training. On average, IRR was 90.5% for engagement and 83.9% for disruptive behaviors coded during classroom observations, and 97.4% for WCPM on both standard passages and training passages.

Goal attainment scaling. Teachers completed two goal attainment scaling (GAS) ratings weekly during the study period. For the first rating, teachers evaluated the student's progress toward the academic engagement goal ("Student consistently is engaged during reading instruction – consistently pays attention, follows directions, participates appropriately, and shows interest and enthusiasm without prompts, reminders or redirection.") using a 7-point scale (-3 to +3). For the second rating, teachers evaluated the student's progress toward the oral reading fluency goal ("Student consistently reads grade-level material with fluency [100% of the time] – consistently reads with accuracy, vocal expression, confidence, and reading speed [not too slow] so as not to impede comprehension.), again using a 7-point scale (-3 to +3).

Social Validity

Teacher acceptability. An adaptation of the *Intervention Rating Profile* (IRP; Witt & Elliott, 1985) was used to assess participating teachers' perceptions of acceptability of *ABC Support*. We expanded the IRP to include parallel items to assess acceptability of *ABC Support* as an intervention for reading and for behavior. The final scale included 23 items (statements) that teachers rated using a 4-point Likert scale (1 = strongly disagree; 4 = strongly agree); total scores had a possible range from 23 – 92. Based on Witt and Elliott's measure, a total score > 46 is above an acceptability threshold.

Teachers also participated in an individual post-intervention interview conducted by members of the research team. The purpose of the 30-minute interview was to supplement the outcome assessment data by soliciting teachers' perspectives about ways in which students benefited from *ABC Support*, in particular changes that teachers noticed in their classrooms that could not be seen through objective measures and observations.

Student acceptability. Members of the research team administered an expanded version of the *Kids Intervention Profile* (KIP; Eckert et al. 2017) to assess student acceptability of *ABC Support*. The KIP is an 8-item scale to measure acceptability of school interventions from the perspective of students who participate in the intervention. The KIP includes questions to which students respond using a five-point scale, ranging from "not at all" to "very, very much." The response format (five boxes of increasing size) allows students to respond using a visual indicator of the relative strength of their response (e.g., largest box means "very, very much"). Because *ABC Support* targets both reading fluency and classroom behavior, two parallel items were added for students to rate improvement (or worsening) of reading separate from behavior. Item ratings ranged from 1-5; total scores across 10 items had a possible range from 10-50. Based on Eckert et al., a Total Scale score > 33 is above an acceptability threshold.

Intervention Implementation

Following a pre-intervention phase that included baseline measurement, teacher training, and student orientation sessions, teachers implemented *ABC Support* three times weekly (20 minutes per session) with their participating student. Teachers conducted the intervention sessions in their classrooms during regularly scheduled periods allocated for supplemental instruction. Four teachers implemented *ABC Support* for 8 consecutive weeks; one teacher implemented the intervention for 7 weeks and another for 6 weeks.

Teachers received two manualized resources during the teacher training sessions to guide implementation of the intervention: (a) an implementation manual providing a detailed explanation of procedural guidelines and semi-scripted intervention steps to enable teachers to implement *ABC Support* with fidelity; and (b) a handbook of implementation materials containing all materials, including training passages, necessary for implementing the *ABC Support* intervention (available at <https://projects.wcer.wisc.edu/abcsupport/>).

In consultation with classroom teachers, the research team created 24 training passages to use for repeated reading practice during the intervention sessions. Each passage was 145-150 words in length. The difficulty level of the passages was approximately late second grade. Using the Spache readability formula (Spache, 1953), the average grade level was 2.95 (range = 2.76 – 3.10). Half of the passages were narrative (fiction), and half were expository (non-fiction). Narrative and expository passages were alternated across intervention sessions.

Each *ABC Support* session incorporated the same sequence of intervention steps. Teachers used a laminated implementation self-guide to ensure steps were implemented in the specific order as prescribed in the manual. Table 3 summarizes the sequence of intervention steps for each session. *ABC Support* was designed to be implemented with fidelity (as scripted) so that all students were exposed to the same evidence-based elements listed in Table 1, as well as with flexibility so that students receive individualized support as needed. To enable all students to achieve their reading fluency and behavior goals, teachers were encouraged to adapt the amount of scripted teacher direction and support to accommodate individual needs for a higher or lower level of teacher scaffolding. The manual includes a table that describes specific options for providing more versus less support for each intervention element, while maintaining a necessary level of fidelity or adherence to the manualized procedures.

Intervention Fidelity

To assess intervention fidelity, three external observers (research team members) conducted observations of approximately 25% of all intervention sessions at randomly determined time points during the implementation period (6-8 weeks). Observers used a structured implementation observation measure to code their observations of sessions. This measure incorporated a checklist format with operational definitions of each intervention step, whereby the observer noted the occurrence or nonoccurrence of each step. Overall integrity was high (95%), ranging from 90% to 98% across teachers. Integrity for individual sessions (across all teachers) varied from 82% (during the first intervention session observed) to 100% (during the last intervention session observed), indicating higher integrity during later sessions.

Research Design and Data Analysis

Multiple-Baseline Design

The *ABC Support* evaluation was designed to meet the What Works Clearinghouse (WWC) *Single-Case Design Pilot Standards* for design standards and evidence criteria (including the current WWC *Standards 4.1*; Kratochwill et al., 2010). In addition, we designed the study to meet the *Single-Case Reporting guidelines In BEhavioural interventions* (SCRIBE) (Tate et al., 2016) and the American Psychological Association reporting standards for single-case quantitative research in psychology (Appelbaum et al., 2018).

The intervention was evaluated with a randomized multiple-baseline design (MBD) across participants (Kratochwill & Levin, 2010) on four outcome measures (Standard Passages WCPM, Training Passages WCPM, Observational Data Engaged, and Observational Data Disruptive). Initially, we structured the design with 1-2 teacher-student dyads per each of four baseline conditions. Teacher-student dyads were randomly assigned to a pre-determined baseline

“wait-time” length of 1, 2, 3, or 4 weeks. Each baseline (“wait list”) period was followed by a 2-week teacher training phase, 1-week student orientation phase, and then an intervention phase initially planned with a length of 8 weeks. A follow-up phase was originally planned for 3-6 weeks (depending on baseline condition). The MBD was selected as it does not require a withdrawal of the intervention once implemented (Kazdin, in press). Because of unforeseen logistical issues, the teacher dyad design-and-analysis strategy could not be executed as planned. A reasonable alternative was implemented instead, with all analyses based on six participating teacher-student dyads, couched within a nonconcurrent (with respect to the study’s chronological time frame) MBD and associated randomization-test analyses.

Primary Analyses of Multiple-Baseline Data

We conducted both visual and statistical analyses of the single-case design data. We adopted the WWC *Single-Case Design Pilot Standards* distinction between design standards and evidence criteria and invoked both visual and statistical analysis to meet these standards (Kratochwill et al., 2010). First, visual analysis was conducted in accordance with the guidelines suggested by the WWC *Pilot Standards*, taking into consideration changes in level (mean), trend (slope), and variability in graphic displays of the data. In the present study, only the first of these summary measures (level) was of *a priori* interest and is reported.

Second, because we incorporated randomization into the MBD, we were able to analyze the data statistically with an appropriate randomization statistical test (Ferron & Levin, 2014). Initially, we had planned to use both case and intervention start-point randomization in the design but due to scheduling and time constraints, only case randomization was implemented, with participants assigned randomly to the initial baseline session at different points in time. We structured our analyses by session numbers (rather than by actual dates), which serendipitously

were ordered with either a one- or two-observation stagger for each of the six participant dyads. Based on these procedures, we adopted the Wampold-Worsham (1984) randomized design and associated randomization test (see Ferron & Levin, 2014 for more detailed information). The test was conducted through a statistical software program, *ExPRT (Excel® Package of Randomization Tests* Version 4.1 (Gafurov & Levin, 2020), to determine whether there were statistical differences between the baseline and intervention levels (means). All analyses were conducted with a Type I error probability of .05 based on directional (one-tailed) statistical tests, insofar as we predicted that implementation of *ABC Support* would improve students' reading fluency and behavior outcomes. Effect sizes were calculated with Parker et al.'s (2014) "nonoverlap of all pairs" (NAP) nonparametric measure (adjusted so that it ranges from 0 to 1), as well as Busk and Serlin's (1992) "no assumptions" standardized mean difference, d (i.e., treatment mean minus baseline mean divided by baseline standard deviation) and its bias-corrected g for a small number of baseline observations (Pustejovsky & Ferron, 2017).

Secondary Data Analysis

In addition to the primary outcome data analyzed in the nonconcurrent MBD, we conducted secondary statistical and descriptive analyses of multiple student outcomes: (a) GAS oral reading and GAS behavior engagement measures collected during pre-intervention and intervention phases; (b) observers' behavior ratings and narrative comments during classroom observations conducted pre- and during intervention implementation; (c) pre- and post-intervention teachers' behavior ratings (SAEBRS and EWL) and students' oral reading fluency (DIBELS); and (d) post-intervention treatment acceptability ratings by students and teachers.

Results

Primary Analyses of Multiple-Baseline Data

Oral Reading Fluency Outcomes

The six students' multiple-baseline outcomes on the standard passages are shown in Figure 5. Based on a visual analysis of these data, all students exhibited an increase in WCPM on standard reading passages from baseline (A phase) to intervention (B phase), which generally coincided with the introduction of the intervention and continued throughout the intervention phase. At the same time, certain fluctuations in the overall pattern are apparent, particularly with Students 2 and 3. The outcomes for Student 1 are more difficult to interpret, owing to the increases in the final three A-phase outcomes just prior to the introduction of the intervention. Also notable in these graphs is the lack of monotonicity in most intervention-phase performance increases, combined with considerable variability in outcomes during intervention.

To further support the visual analysis of the data, a multiple-baseline randomization test yielded a statistically significant increase from baseline to intervention ($p = .006$), with respective across-student means of 59.3 WCPM (baseline) and 72.0 WCPM (intervention). The average effect-size d was 1.33, with an associated g of 1.21 and an adjusted NAP of .57. An average of almost 60% of the students' A- and B-phase reading fluency outcomes on the standard passage outcomes were nonoverlapping. It is important to note that the preceding summary statistics are based on a general comparison of students' A- and B-phase observations, which are not directly connected to the structured omnibus multiple-baseline randomization test that was conducted.

A similar pattern of results was found for WCPM on training passages (see Figure 6) with more pronounced intervention effects. All students exhibited substantial increases in WCPM on training passages from baseline to intervention, again coincident with the introduction of the intervention. Student 6's increased performance should be viewed with some caution in

that the trend represented by the last three baseline measures may have augured a nonintervention-based improvement.

A randomization test conducted on these data revealed a statistically significant change in level across students following the introduction of the intervention ($p = .001$), from a baseline (A phase) mean of 60.0 WCPM to an intervention (B phase) mean of 91.2 WCPM. The average effect-size d was 2.80, with an associated g of 2.53 and adjusted NAP of .94. The high NAP value indicates there is little overlap between each student's baseline and intervention data points.

A reviewer of an earlier version of the manuscript was concerned that each of the two analyses conducted in this oral reading fluency “family” was based on a Type I error probability of .05, thereby resulting in a familywise Type I error probability that could be as high as .10. Our pre-established per-test Type I probability of .05 was a level that we were comfortable with, but we note here that even accepting the reviewer's suggested reduced per-analysis Type I error probability of .025, both analyses would have yielded statistically significant results.

Behavior Outcomes

Improvement in the occurrence of engaged (Figure 7) and disruptive (Figure 8) behavior among participating students during regular classroom reading instruction was also evident based on both visual and statistical analyses. Inspection of Figure 7 shows that the level of engagement improved in all students. Although engagement was high during baseline for three students and despite some variance in each of the data series, visual analysis of the graphs shows support for an effect of the intervention. There was a statistically significant increase in students' engaged behavior ($p = .001$), from an average of 63% engagement during the baseline phase to 82%

engagement during the intervention phase. The average effect-size d was 1.14; the average g was 1.03; and the average adjusted NAP was .55.

Reduction of disruptive behavior is visually apparent in Figure 8 for five out of the six students who received the intervention. It is also clear that baseline disruptive behavior was not at a high level for Students 3 and 6. Nevertheless, there was a clear level change for others, and these effects were not compromised by variability or trend. There was a statistically significant decrease in students' disruptive behavior ($p = .001$), from an average of 18% occurrence during baseline to 7% during intervention. The average effect-size d was -0.85, with an associated g of -0.76 and average adjusted NAP of .50.

The same response to the reviewer's Type I error concerns regarding the oral fluency data analyses applies here for the two behavior outcome analyses. Specifically, had each analysis been conducted with a Type I error probability of .025 (instead of our preselected .05), each would have been statistically significant.

Secondary Data Analyses

GAS Ratings

GAS oral reading and behavior engagement scores were analyzed by means of a one-sample permutation test applied to the mean pre-intervention to intervention change scores. GAS scores ranged from -3 to +3 so that negative scores can move to positive to assess effectiveness. On both outcome measures, there was an increase in mean scores that was statistically significant, $p = .008$. For oral reading, students' mean scores improved from -0.33 to 1.13, $d = 1.67$; and for behavior engagement, students' mean scores improved from -0.10 to 1.19, $d = 1.70$. Because the data are derived from a one-sample pre-post design with no randomized control condition, there are multiple factors apart from *ABC Support* that could account for any

improvement in GAS ratings, including student development/maturation, as well as the effects of classroom instruction and teacher behavioral influences throughout the academic year.

Observer Behavior Ratings and Narrative Comments

Classroom observers provided global ratings of five learning-related behaviors at the conclusion of every 20-minute observation period. Each behavior (paying attention, following directions, participating appropriately, showing interest, and displaying enthusiasm) was rated using a scale ranging from 1 (mostly did not occur) to 3 (mostly did occur). Figure 9 shows the ratings averaged across all students for observations that occurred prior to the initiation of the intervention (pre-intervention) versus observations that occurred during implementation of *ABC Support* (intervention). Although these data are descriptive, on average, students received higher overall behavior ratings during the time in which they were participating in *ABC Support*.

At the end of every observation period, observers also provided open-ended comments about students' behavior, attitude, and engagement; and/or significant aspects of the classroom instruction. A total of 131 comments were generated across all observations for the student participants. The comments were transcribed, listed in random order, and then rated by two independent coders using a 4-point scale: 1 = mostly negative comments; behavior mostly falls below expectations; 2 = slightly more negative than positive comments; behavior falls below expectations more than it meets expectations; 3 = slightly more positive than negative comments; behavior meets expectations more than it falls below expectations; and 4 = mostly positive comments; behavior mostly meets expectations. Coders agreed on their numerical ratings for 98 (75%) of the comments. When coders disagreed (25% of comments), their ratings differed by only one point and were averaged to derive a final rating. Figure 10 shows the average ratings of comments for observations that occurred prior to implementation (pre-intervention) and during

implementation of *ABC Support* (intervention). As shown in the graphs, for five of six students, ratings of comments during the implementation of *ABC Support* were higher than for comments prior to implementation of the intervention. Interestingly, although observers were not specifically directed to note whether teachers prompted use of the *I CAN READ* card, more than 20% of the comments included some reference to students' use of the self-monitoring tool during reading instruction. Overall, these descriptive changes in both behavior ratings and narrative comments align with the previously reported statistically significant improvements in observed engagement and disruptive behaviors from the baseline to the intervention phase.

Teacher Behavior Ratings and Students' Reading Fluency at Pre- and Post-Intervention

As part of the pre-intervention student screening procedures, teachers completed the SAEBRS and EWL. At the conclusion of the intervention period (approximately 5 months post-screening), teachers completed each measure again. The bar graphs in Figure 11 display the average scale scores at screening (across all students) and at post-intervention. In addition, the risk cut-off score for each scale is depicted. At post-intervention, all students received ratings for two behaviors targeted by *ABC Support* that were above the risk cut-off, specifically, academic behavior ($M = 11.85$) and engagement ($M = 15.86$).

Three students were also re-administered the reading fluency screening measure (DIBELS) at post-intervention. Because of school closures due to Covid-19, the research team was unable to administer the reading fluency probes to the remaining three students. At post-intervention, two of three students (#2 and #3) obtained a median WCPM score above the risk cut-off (> 75); one student (#1) obtained a WCPM (61) that was higher than screening, but still below the cut-point for risk.

Treatment Acceptability Ratings

At post-intervention, teachers completed a 22-item measure, *Teacher Evaluation of ABC Support*, to report their level of acceptability of the *ABC Support* intervention. On this measure, teachers rated their agreement with 22 statements related to perceived effectiveness (e.g., “*ABC Support* is effective for improving reading fluency.”), implementation features (e.g., “Overall, the *ABC Support* materials are easy to use.”), and satisfaction with *ABC Support* (e.g., “I would use *ABC Support* again.”). Each item was rated using a 4-point scale, ranging from strongly disagree (1) to strongly agree (4). Overall, teachers provided a positive evaluation of *ABC Support*, with an average item rating of 3.27.

During the post-intervention interview, teachers described multiple benefits for students who received the intervention, including overall improvement in reading fluency and accuracy and more positive attitude and enthusiasm about reading (67% of teachers). All teachers reported the focus on positive expectations in *ABC Support* was useful in building a stronger relationship with their student. Beyond an increase in positivity towards reading, teachers observed an increase in students’ focus and on-task behavior during independent and small-group reading activities – although not necessarily during whole-group instruction. Teachers reported that these benefits likely would have been maintained if the school year had continued. Each teacher also identified at least three intervention components they believed were “most effective,” including graphing, using the reinforcement chart, modeling fluent reading and engaged behavior, providing error correction, and offering specific praise; all teachers said the *I CAN READ* card helped students to generalize the *READ* expectations to regular reading instruction. Moreover, three teachers noted they acquired skills related to teaching reading (e.g., error-correction procedures, repeated reading with modeling). Finally, teachers rated the efficiency and effectiveness of *ABC Support*’s combined focus on reading and behavior on a scale from 1

(lowest in terms of efficiency and effectiveness) to 4 (highest in terms of efficiency and effectiveness); the average rating across teachers was 3.67. Half of the teachers reported that *ABC Support* is equally or more effective in strengthening reading fluency and engagement behaviors compared to other Tier 2 academic and/or behavior interventions used in their schools.

Due to COVID-19 school closures, only three students were able to complete a 10-item *Student Evaluation of ABC Support* measure. On this measure, six items asked about the overall acceptability of the intervention (e.g., “How much did you like reading the short passages and practicing the READ expectations each week?”), and four asked about the student’s improvement (e.g., “Do you think your reading improved?”). Students answered each question using a 5-point scale where a rating of 5 means “very, very much,” and 1 means “not at all.” Finally, students used the same 5-point scale to respond to a question about the benefit of the *I CAN READ* card. Like the teacher participants, student participants reported overall high acceptability of *ABC Support* ($M = 4.50$) and improvement in their reading and behavior ($M = 5.00$). Students also indicated the *I CAN READ* card helped them in the classroom “very, very much” ($M = 5.00$).

Discussion

Based on empirical, efficiency, and theoretical rationales, we developed an integrated supplemental intervention, called *ABC Support*, that merged both shared and unique evidence-based elements of academic and behavior interventions for early elementary students. An integrated academic-behavior focus has not been extended systemically to Tier 2 or supplementary interventions. Instead, Tier 2 interventions typically target academic and/or behavior deficits independently, with separate protocols to treat these problems (Stewart et al., 2007; Tackett et al., 2009). As predicted in our theory of change (Figure 3), implementation of

ABC Support contributed to statistically significant benefits for both the targeted behavior and academic skills. These findings lend strong support for an empirical link between behavior and academic performance (Algozzine et al., 2011; Metcalfe et al., 2013; Morgan et al., 2008). Moreover, the findings suggest there is efficiency and effectiveness with an integrated approach that may not always be achieved with a parallel or sequential approach for delivering academic and behavior interventions (Ervin et al., 2006). Because the emergence of intervention effects was synchronous with the staggered intervention start points of a case-randomized multiple-baseline design, the credibility of conclusions stemming from those randomization-test analyses is strengthened.

Based on our theory of change, we predicted that students' use of the *ABC Support* self-checklist (*I CAN READ*) to monitor their performance during regular reading instruction would facilitate generalization of reading and behavior expectations from the intervention to the non-intervention classroom setting. Although we did not directly assess students' use of the self-checklist, three sources of supplementary descriptive data offer some support for this prediction. First, 20% of observer comments during the classroom observations specifically referenced the *I CAN READ* card (e.g., "Teacher directed student to use his *I CAN READ* card when he started to go off-task." "Student repeated the READ expectations to herself at the start of reading instruction."). Second, during the post-intervention interviews, all teachers indicated the self-checklist was effective in helping students remember the READ expectations during regular classroom instruction. Lastly, every student who completed the post-intervention acceptability measure indicated the *I CAN READ* card helped them in the classroom "very, very much."

We also found support for our prediction that strengthening reading fluency and engagement during the *ABC Support* intervention sessions, combined with generalizing reading

and behavior expectations to the classroom setting through the *I CAN READ* self-checklist, would improve reading fluency on non-training passages and learning-related behaviors during classroom reading instruction outside of the treatment setting. First, students demonstrated significant gains in WCPM on standard reading passages that were not used for repeated reading practice during the intervention. The average gain in reading fluency from baseline to intervention was 12.9 WCPM. Depending on the number of weeks of implementation (6-8 weeks), the expected normative growth across this time period is 7.2 to 9.6 (1.2 gain per week; Tindal & Nese, 2013). Therefore, *ABC Support* resulted in 35% to 80% more growth in reading fluency than what would be expected normatively. In addition, through the integration of a simultaneous focus on behavior during each *ABC Support* intervention session (i.e., clear expectations, behavior goals, earning and graphing points, feedback and praise, behavior redirection, and reinforcement), students displayed higher rates of engagement (19% increase) and lower disruptive behavior (11% decrease) during classroom reading instruction from baseline to intervention. Importantly, these positive behavior outcomes were achieved *without* delivering a separate behavior intervention.

Facilitative Implementation Factors

Two facilitative factors related to *ABC Support* implementation – low cost and high fidelity – likely contributed to the positive student outcomes. In conducting an analysis of the costs associated with *ABC Support* implementation, we focused on incremental costs, i.e., expenditures incurred above and beyond the resources, time allocations, and space already available in the classroom or school (Boardman et al., 2011). Overall, the intervention was low in cost because it involved minimal, if any, new or additional expenditures to implement. That is, *ABC Support* implementation required already-available classroom space, relied on the existing

school-wide screening procedures, and involved personnel already employed by schools to implement Tier 2 interventions. Moreover, the training and implementation materials for *ABC Support* were easily accessible and available online at no cost.

Despite the unanticipated need to discontinue the intervention phase prematurely, teachers displayed a high level of integrity of *ABC Support* implementation. Overall average integrity scores were high across all the teachers (90% to 98%), and integrity for individual sessions (across all teachers) improved over the duration of intervention sessions. Although the intervention dosage effect is often considered part of the integrity construct (Sanetti & Kratochwill, 2014), we learned that even with a shorter-than-planned duration of the program (6-7 weeks versus 8 weeks), positive outcomes can be achieved for students. We also surmise that the high acceptability of the intervention contributed to these positive effects.

Limitations

Despite these promising findings, there are some limitations of our evaluation study. First, due to school closings, we were unable to implement the planned 3- to 6-week follow-up phase to examine the durability of our findings. At this time, we do not have student performance data to indicate whether the gains in reading fluency and engagement behavior were maintained once the intervention ended. During the post-intervention interviews, however, teachers reported a likelihood that the gains would be maintained, to some degree, following the intervention. Second, for research purposes, the intervention was delivered in a controlled, one-to-one format to test the efficacy of an integrated intervention; the positive outcomes may, in part, be due to the individualized nature of the protocol. We are currently extending our intervention research to a small-group format and will learn about its efficacy in this more typical Tier 2 school application. Additional implementation features associated with a research project may also have

enhanced our findings. For example, research staff provided on-site training and coaching for teachers. Moreover, teachers consented to participate in the research and, as such, were likely motivated to achieve positive outcomes. Third, classroom teachers implemented the intervention. Although teacher implementation is typical for many supplemental interventions, an extension of *ABC Support* implementation to parents may increase the potency of the intervention for academic and behavior outcomes. Such a conjoint extension of the protocol to incorporate parent involvement would not only facilitate stronger outcomes, but also promote generalization of students' skills and positive behavior across settings (Garbacz et al., 2018). Finally, the sample size in our single-case design experiment necessitates replication with other students and with a larger and more diverse sample. Indeed, some supplementary analyses were descriptive, rather than statistical, owing to the small number of participants.

Implications for Practice

We achieved important findings for school psychologists and other school-based professionals that have implications for future practice. Our results suggest that an integrated academic-behavior intervention such as *ABC Support* has potential for providing students with a strong Tier 2 intervention. Integrated academic and behavior interventions are more powerful than traditional single-focus approaches because the intervention “ingredients” are merged to produce combined and collateral effects greater than each separate intervention (Cook et al., 2012; Kuchle et al., 2015). Our findings also underscore the importance of assessing both academic and behavior dimensions of students who present with reading problems. Likewise, an examination of student behavior problems would suggest that careful assessment of academic literacy skills is necessary for a complete understanding of student problems and for the design of interventions. Ultimately, an understanding of both academic and behavior domains and

subsequent integrated intervention approach are more likely to result in positive outcomes for students overall than a traditional single-focus approach.

ABC Support is also a cost-effective intervention for school personnel to implement. All *ABC Support* materials are available on our web site and accessible to professionals interested in adopting the program. Given the availability of structured training, coaching, and intervention materials, the program requires minimal time for a school psychologist to set up and monitor. From a cost-analysis perspective, the resources to implement *ABC Support* do not result in significant expenditures for a school. For example, beyond teacher training time (1-2 hours), current resources within a classroom/school may require some reallocation to use *ABC Support* in lieu of other Tier 2 interventions. Overall, the anticipated benefits (effectiveness) of *ABC Support*, based on our experimental test of outcomes, underscore the cost-effectiveness of the intervention.

Conclusion

The development of *ABC Support* was grounded in a reciprocal-deficit pathway framework and predicated on the assumption that educators can improve effectiveness and efficiency by integrating a combined focus on behavior and academic skills. Through *ABC Support*, evidence-based strategies for separate reading fluency and behavior interventions were retained, while merging their common intervention components (e.g., performance feedback). Our evaluation of *ABC Support* yielded promising evidence that an integrated, supplemental intervention can simultaneously strengthen both oral reading fluency and engagement behaviors in early elementary students. Integrated supplemental interventions are not limited to the reading-fluency skills and engagement behaviors targeted in *ABC Support*. Given the well-

documented academic-behavior connection and growing need for efficient school-based practices, our findings underscore the value of providing integrated interventions.

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Table 1*Integrated Application of Intervention Elements in ABC Support*

Element	Application of element in ABC Support	Research conclusions
Expectations	Expectations for reading and behavior are (a) clearly stated, positively worded, and displayed; (b) taught during orientation session(s); and (c) reviewed during each session.	Clear expectations help students understand how to achieve goals and maintain positive behavior and reading performance.
Goal setting	Reading and behavior goals are set at the start of each session; progress toward goals is monitored; students are rewarded for meeting goals.	Setting goals is linked to success in goal attainment and increases students' ability to self-regulate.
Modeling	Teacher demonstrates fluent reading and engaged behavior while reading aloud; students model teacher behavior (fluent reading and engaged behavior).	Modeling allows students to observe what is expected – to see what fluent reading and engaged behavior look like.

Repeated practice and rehearsal	Each passage reading provides an opportunity for students to both practice fluent reading and rehearse appropriate engagement behaviors.	Repeated practice/rehearsal gives multiple opportunities to be successful; fluency and behavior improve with practice.
Prompts	Through prompting, teacher reminds students of reading and behavior expectations prior to each passage reading.	Prompting encourages students to “do their best” and self-correct.
Feedback and praise	Teacher provides specific feedback and positive praise statements following each passage reading relative to both reading and behavior expectations.	Feedback/praise informs students what needs improvement and what they are doing well.
Reading error correction and behavior redirection	Following a passage reading, teacher (a) selects missed/difficult words and provides letter-word-phrase correction; and (b) corrects behavior by redirecting students to exhibit positive examples of expected behavior.	Reading error correction and behavior redirection allow students to correct and practice accurate reading and appropriate behavior.

Element	Application of element in ABC Support	Research conclusions
Recording and graphing	Behavior points and words read correctly are recorded/graphed following each passage reading and compared to students’ goals.	Students “see” their performance and progress through recording and graphing to monitor progress.
Rewards	At the end of each intervention session, students receive rewards (stickers on chart) for reaching reading and/or behavior goals.	Students are rewarded for achieving their goals to increase “buy-in” and motivation.
Self-monitoring	Students assume increasing responsibility across sessions to monitor their performance relative to goals; students self-monitor performance relative to reading and behavior expectations during classroom instruction.	Self-monitoring teaches students how to maintain learned skills, increases motivation, and contributes to success outside of intervention.
Structure	Intervention sessions are structured and follow a consistent, predictable sequence of steps.	Structure maximizes success by increasing awareness of expectations.

Appropriate scaffolding	Across intervention sessions, level of teacher direction/scaffolding is reduced in response to student's ability to assume greater independence.	Matching amount of scaffolding to student need/level allows them to be successful and engaged.
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Table 2*Characteristics of Teachers and English Language Arts Classrooms*

Teacher Characteristics					ELA Classroom Characteristics ^a		
Race and Gender	Highest Degree	Years Teaching Experience	Knowledge of MTSS for Reading ^b	Knowledge of MTSS for Behavior ^b	Total Students	Gender	Race
100% white	50% bachelors	5-22 years	3.00 (5) 2.00 (1)	3.00 (4) 2.00 (2)	15-21 students	37%-67% boys	42%-95% white
100% female	50% post-bachelors	<i>median:</i> 12.0	<i>mean:</i> 2.83 <i>moderate</i>	<i>mean:</i> 2.67 <i>moderate</i>	<i>median:</i> 19	<i>median:</i> 54%	<i>median:</i> 90%

^a Demographics of classrooms in which participating students received ELA instruction.

^b Based on 4-point self-rating of knowledge (1=very low; 2=low; minimal; 3=high; moderate; 4=very high).

Table 3

Sequence of Steps for ABC Support Intervention Sessions

1. Review reading and behavior expectations.
2. Determine reading goal and record on reading graph; determine behavior goal and record on behavior graph.
3. Prompt reading and behavior expectations. Implement first timed reading of training passage.
4. Provide feedback relative to reading expectations and goal; record words correct per minute (WCPM) for first timed reading on reading graph; give specific praise.
5. Provide feedback relative to behavior expectations and goal; circle/record points for behavior during first timed reading on points card; give specific praise.
6. Prompt reading and behavior expectations. Demonstrate fluent reading and engaged behavior while reading aloud the training passage (modeling).

7. Prompt reading and behavior expectations. Implement second timed reading of passage.
8. Use letter-word-phrase correction procedure for 1-3 difficult words.
9. Provide feedback relative to reading expectations and goal; record WCPM for second timed reading on reading graph; give specific praise.
10. Provide feedback relative to behavior expectations and goal; circle/record points for behavior during second timed reading on points card; give specific praise.
11. Prompt reading and behavior expectations. Implement third timed reading of passage.
12. Provide feedback relative to reading expectations and goal; record WCPM for third timed reading on reading graph; give specific praise.
13. Provide feedback relative to behavior expectations and goal; circle/record points for behavior during third timed reading on points card; give specific praise.
14. Graph WCPM on reading graph and give feedback. Record total behavior points on behavior graph and give feedback. Give rewards for meeting reading and/or behavior goals.
15. Remind student to use checklist of reading and behavior expectations to self-monitor performance during regular classroom instruction.

Figure 1

Reciprocal Deficit Pathway Model Underlying the Conceptualization of ABC Support

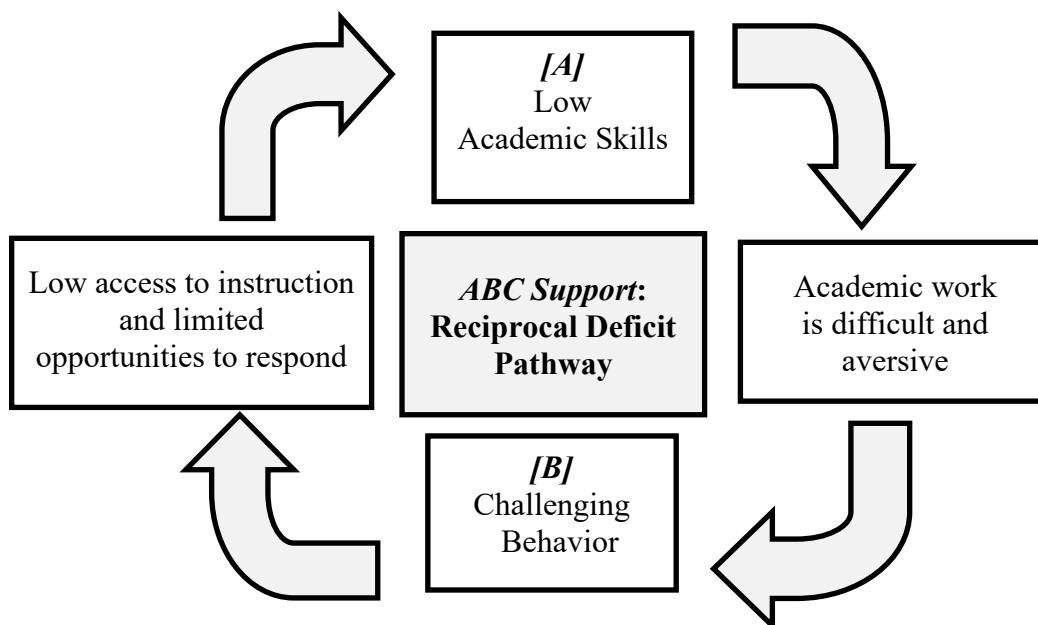


Figure 2

Balance of Shared Elements and Skill-Specific Strategies in Integrated Interventions

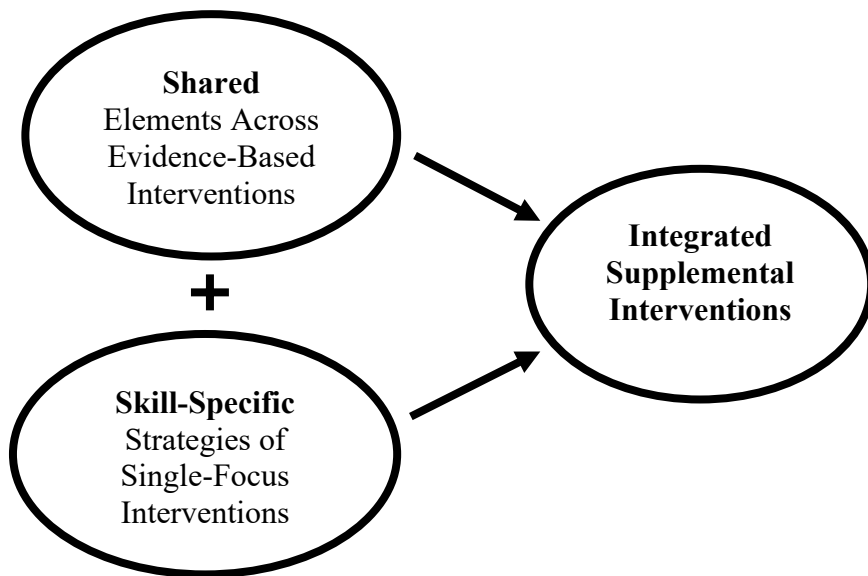
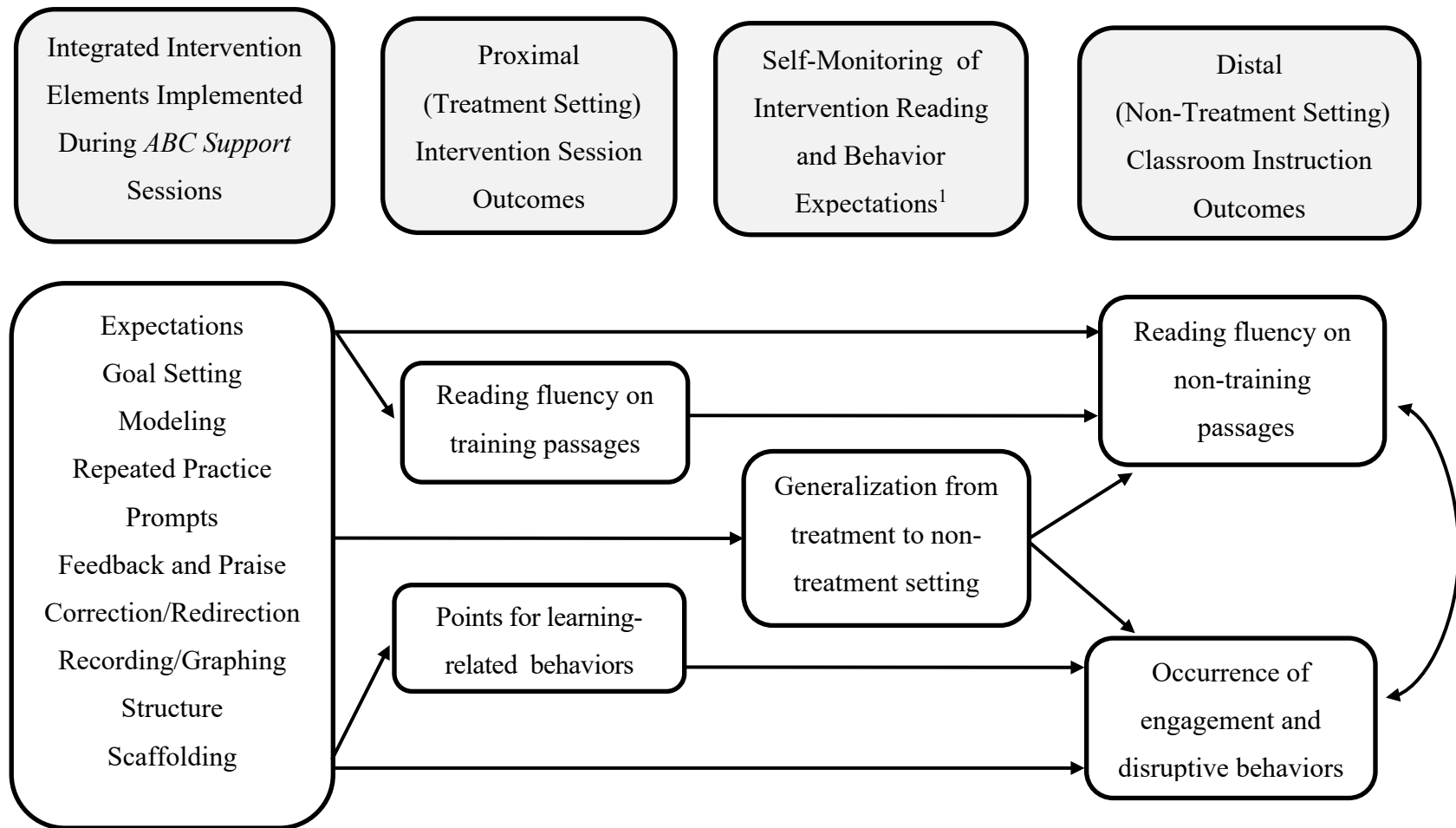


Figure 3

ABC Support Theory of Change



¹ Use of *I CAN READ* self-monitoring card.

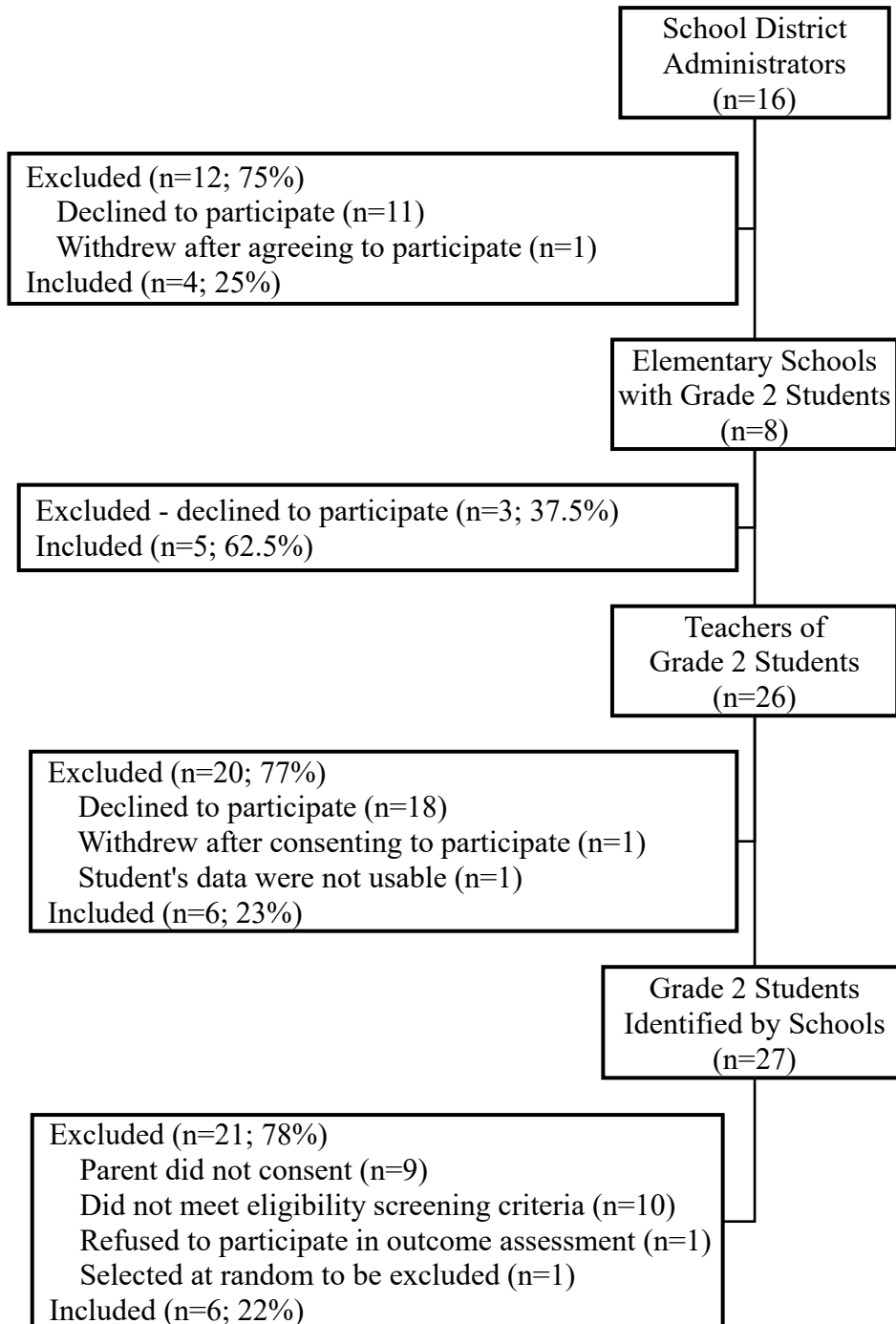
Figure 4*CONSORT Diagram for ABC Support Recruitment and Participation*

Figure 5

Multiple-Baseline Graphs of Student Performance on Standard Reading Passages

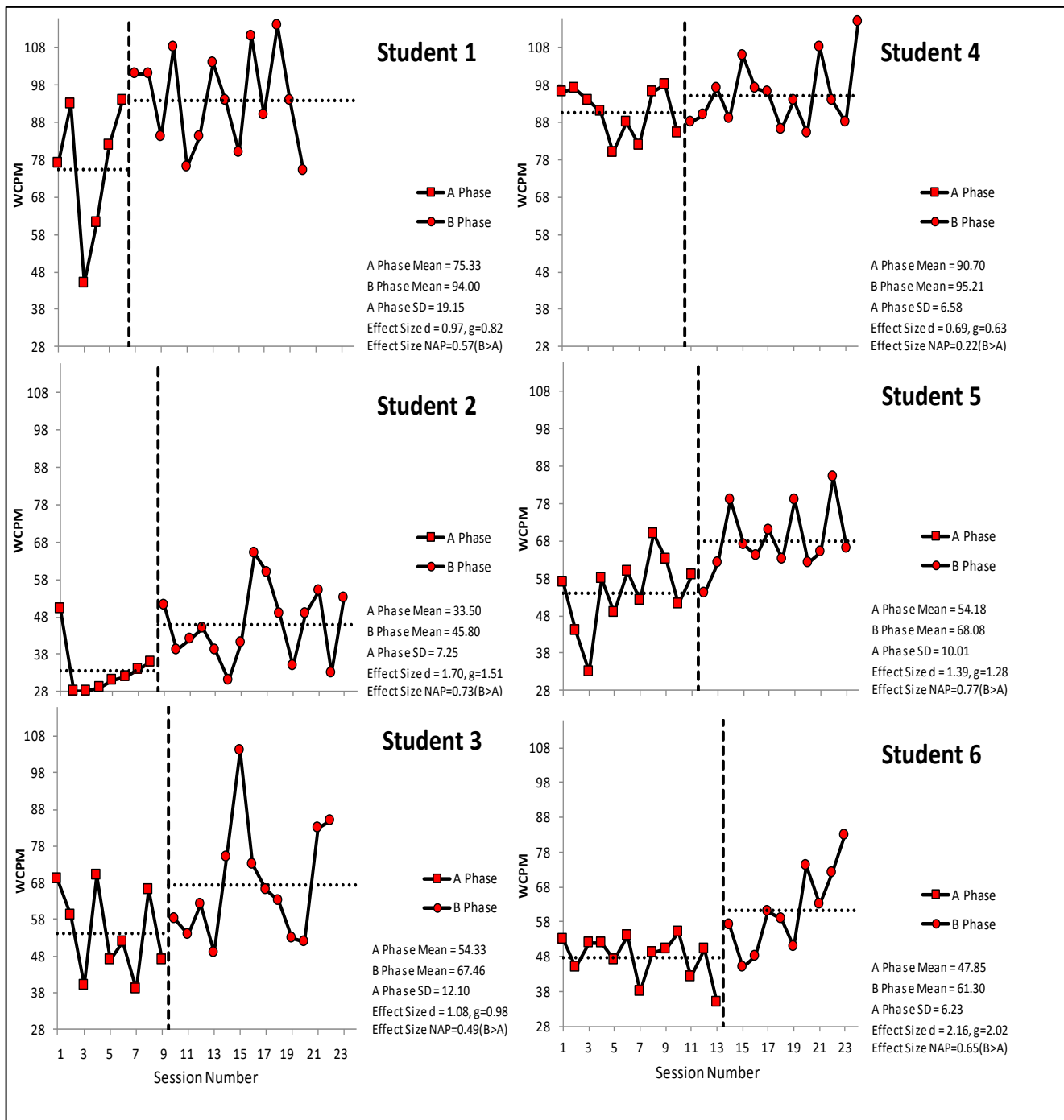


Figure 6

Multiple-Baseline Graphs of Student Performance on Training Reading Passages

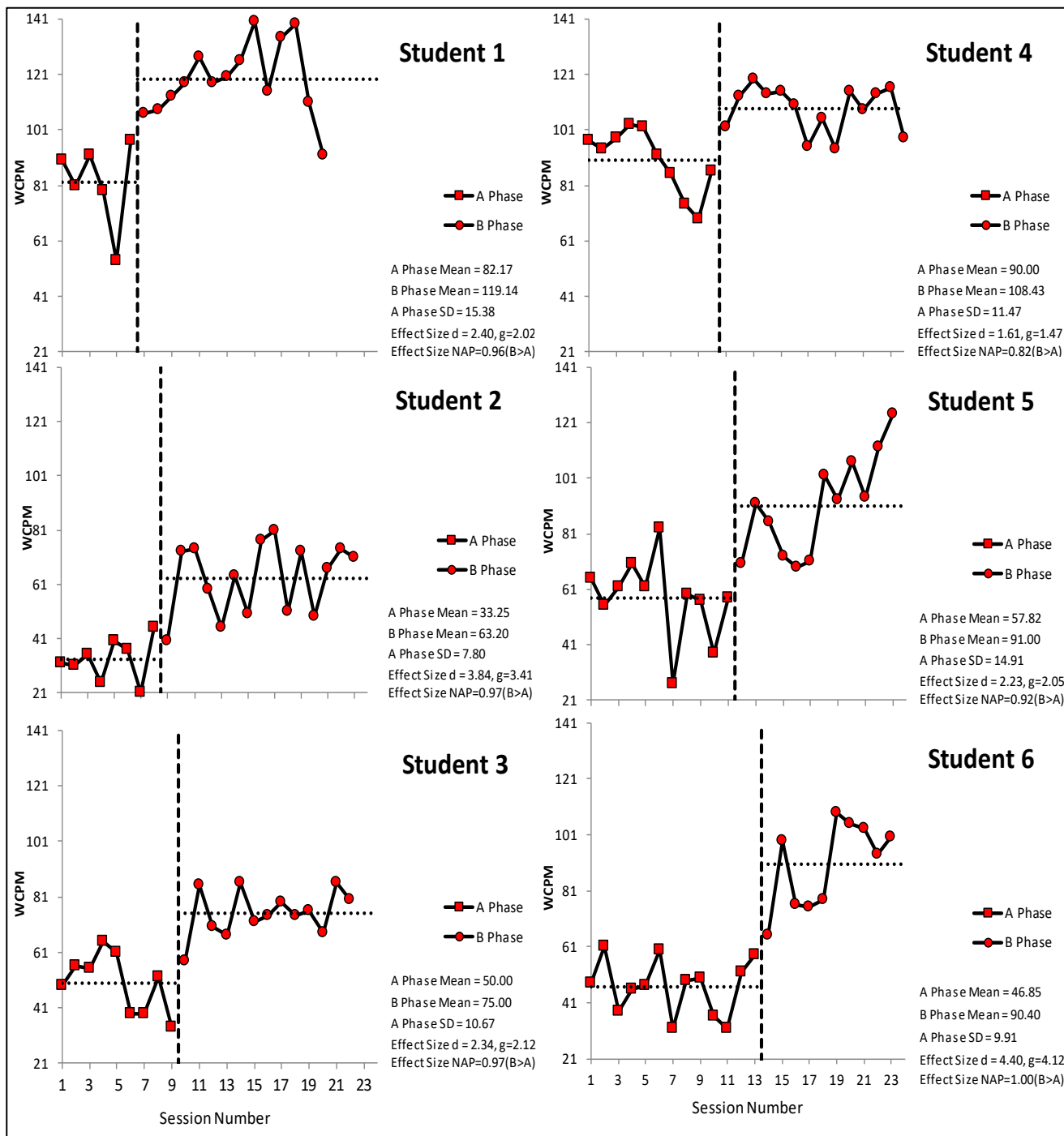


Figure 7

Multiple-Baseline Graphs of Student Engagement During Reading Instruction

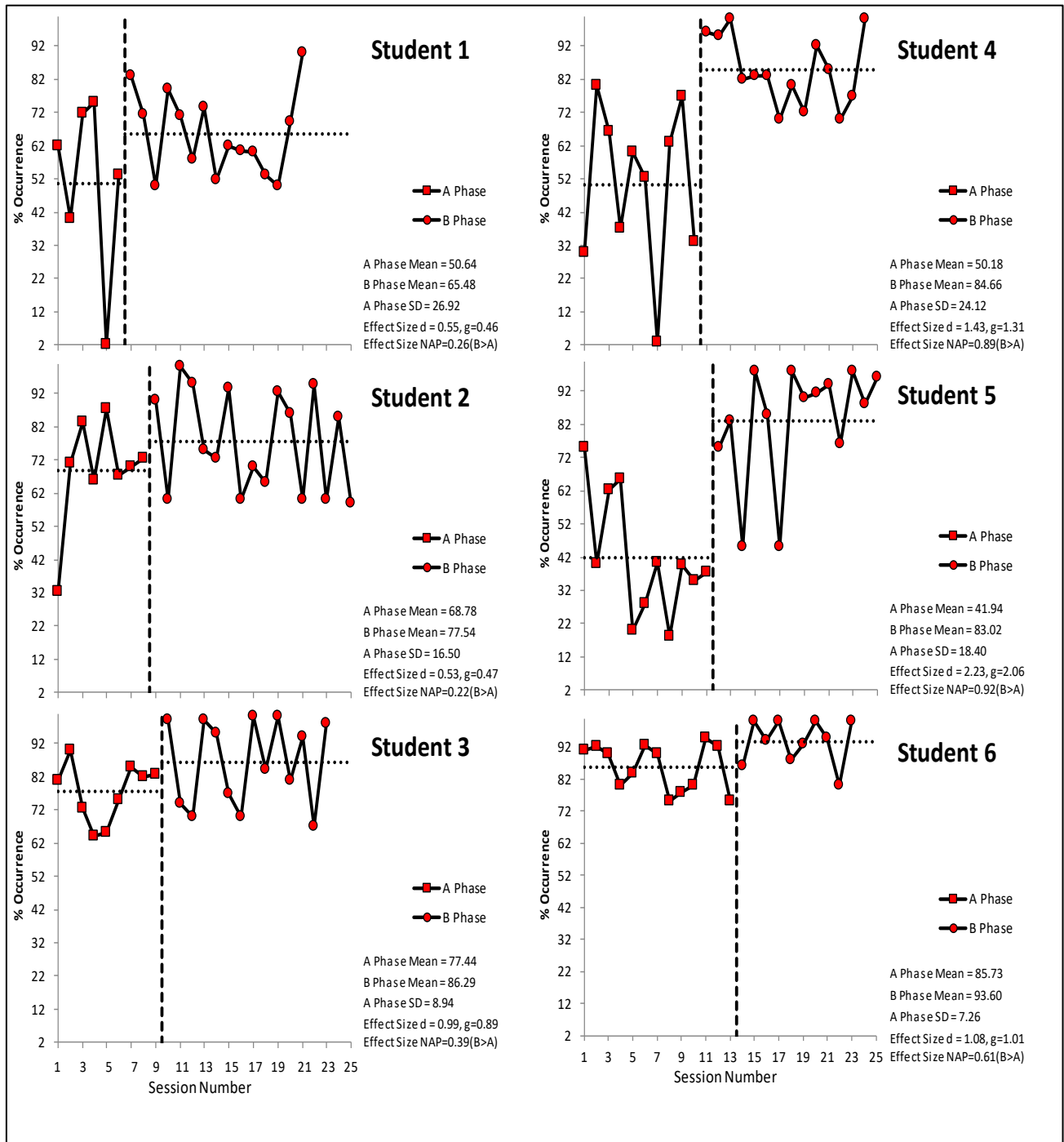


Figure 8

Multiple-Baseline Graphs of Student Disruptive Behavior During Reading Instruction

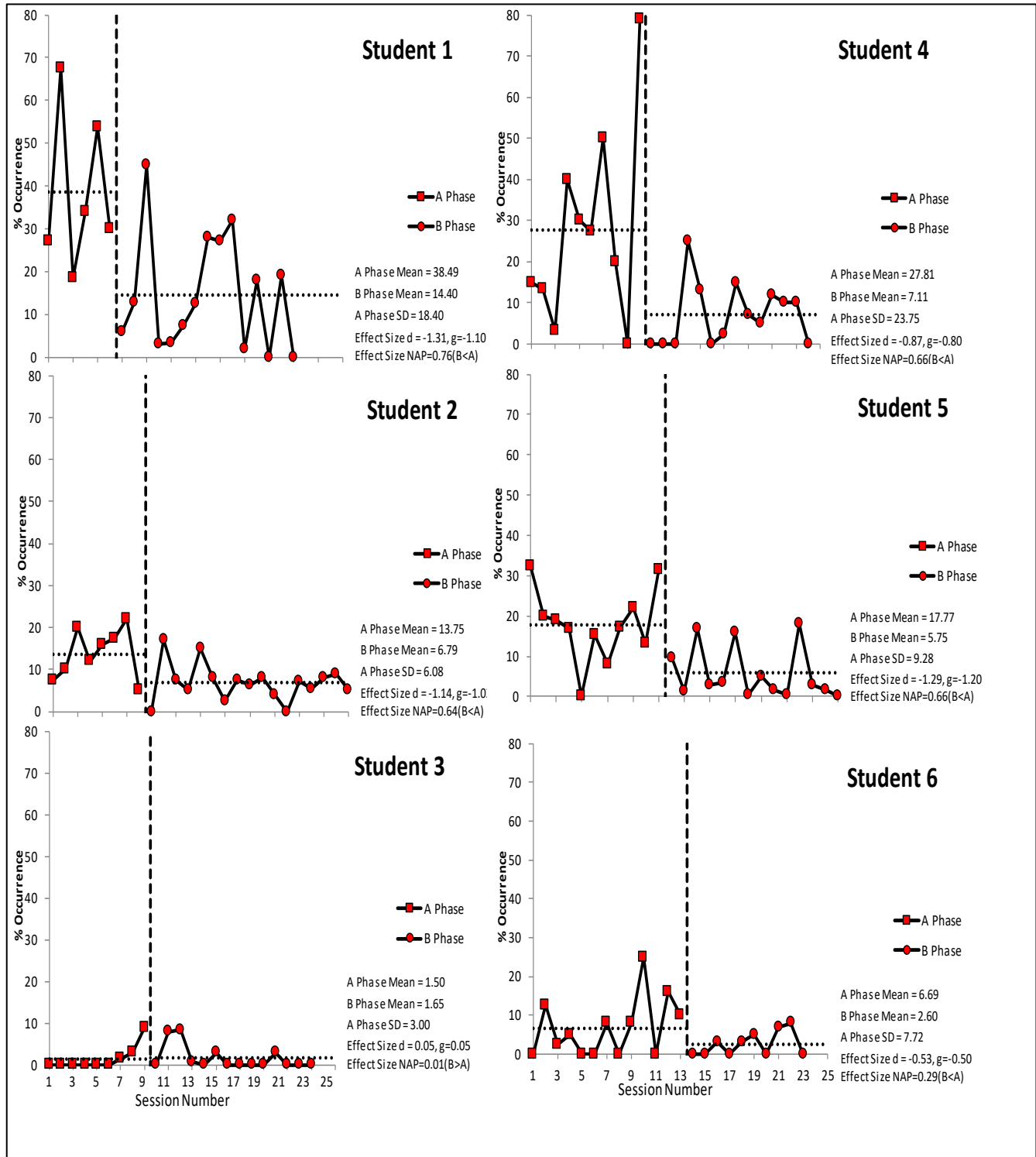


Figure 9

Average Observer Ratings of Student Behavior for Classroom Observations Conducted Prior to and During Intervention Implementation

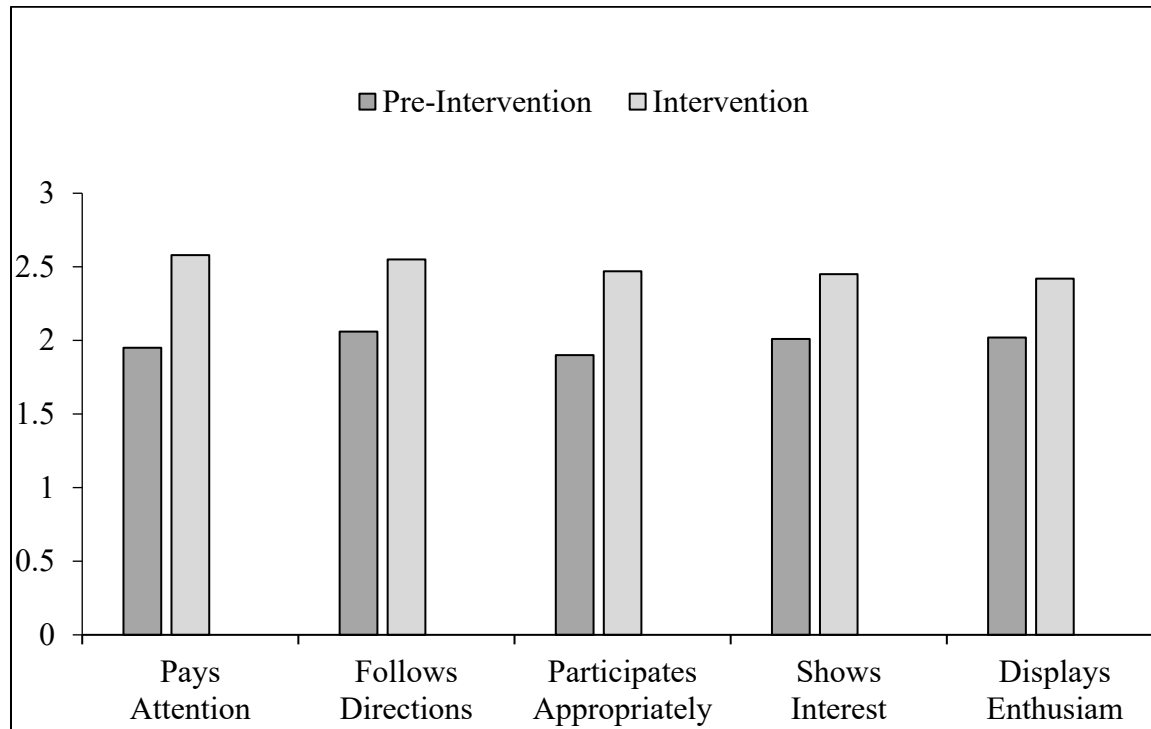


Figure 10

Average Ratings of Observer Comments for Student Participants Prior To and During Implementation of ABC Support

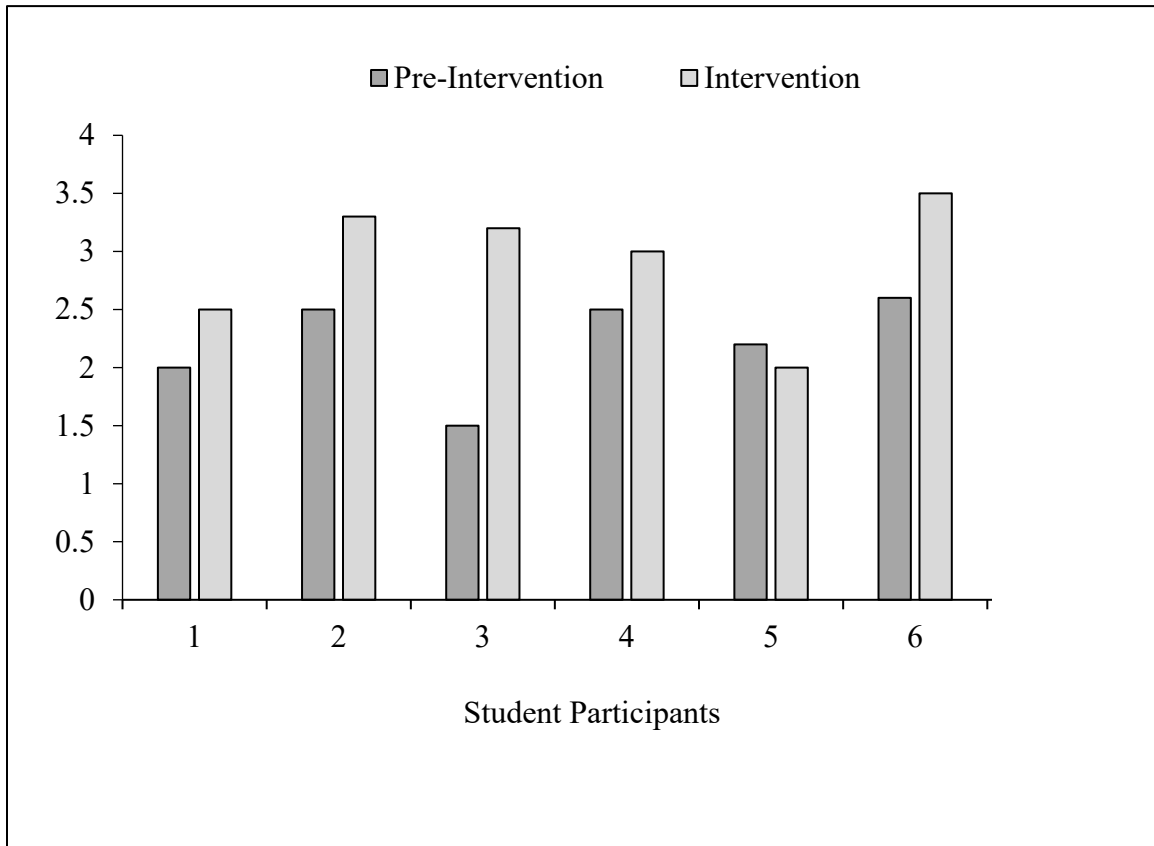


Figure 11

Teacher Behavior Ratings at Screening and Post-Intervention Averaged Across Students

