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The Effects of Peer-Assisted Learning on Disruptive Behavior and Academic Engagement

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Abstract

Education researchers have recently called for the development of interventions to address the needs of students with or at risk of disabilities who exhibit co-occurring academic and behavioral needs. Teachers of these students frequently prioritize intervening on problem behavior rather than academics. However, addressing students' academic needs with interventions that change classroom environments may reduce problem behavior. This study examined the effects of a reciprocal peer-tutoring program on disruptive behavior and academic engagement. An A-B-A-B design was implemented in an eighth-grade intervention classroom receiving Tier 2 supports from a general educator, with one student who demonstrated frequent disruptive behavior and concomitant reading difficulty. Results support a functional relation between the intervention and changes in disruptive behavior and academic engagement. Implications for future research and practice are discussed.

Keywords

behavior, adolescent, literacy, peer-mediated procedures

Students with or at risk of disabilities who have intensive academic needs often have co-occurring behavioral difficulties (Berry Kuchle, Zumeta Edmonds, Danielson, Peterson, & Riley-Tillman, 2015). Poor reading and academic performance have been linked to poor life outcomes, including high school dropout, delinquency, and involvement in the criminal justice system (Reid, Gonzalez, Nordness, Trout, & Epstein, 2004). Because of these comorbid difficulties, there has been a recent push in special education research to integrate academic and behavioral interventions (National Center on Intensive Intervention [NCII], 2013).

Although academic intervention alone does not always improve classroom behavior (e.g., Nelson, Lane, Benner, & Kim, 2011), simultaneously addressing academic and behavioral needs may improve both outcomes for students. Some academic interventions simultaneously address behavior by modifying the classroom environment. Components of these interventions include peer tutoring, increased opportunities to respond, positive feedback, and structure. All of these practices have been found to improve student engagement or behavior (Simonsen, Fairbanks, Briesch, Myers, & Sugai, 2008), and can be embedded in academic interventions (e.g., Bowman-Perrott, Burke, Zhang, & Zaini, 2014; Kaya, Blake, & Chan, 2015; Wehby, Falk, Barton-Arwood, Lane, & Cooley, 2003). Teachers who use such practices tend to have students who demonstrate higher levels of engagement in instruction, which may have collateral effects on academic outcomes (Gage, MacSuga-Gage, Prykanowski, Coyne, & Scott, 2015; Gage, Scott, Hirn, & MacSuga-Gage, 2018). This evidence supports the call for interventions to address academic and behavioral needs (Berry Kuchle et al., 2015).

Furthermore, students with co-occurring academic and behavioral needs are increasingly served in the general education setting. The majority of students with disabilities spend 80% or more of the school day in general education classrooms (National Center for Education Statistics, 2015). As the implementation of Response to Intervention (RTI) models has increased, students with co-occurring academic and behavioral needs are often served in general education settings (e.g., Tier 1, Tier 2, Tier 3) before receiving special education services. Unfortunately, at least one research team has found teachers provide less academic instruction to students exhibiting disruptive behavior than students displaying appropriate classroom behavior (Wehby, Lane, & Falk, 2003). Many teachers feel unprepared to teach

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students with challenging behavior, in part because general education teacher preparation programs often require few, if any, courses in behavioral management or special education (e.g., DeSimone & Parmar, 2006). Even special education teacher preparation programs frequently fail to provide adequate instruction in classroom management (Oliver & Reschly, 2010).

Given the connection between students' academic and behavioral performance, teacher preparation and practice should emphasize high-quality, engaging academic instruction that incorporates components of effective behavior management. Functional assessments have found students' problem behavior to be commonly maintained by access to peer attention or escape from academic demands (e.g., Turton, Umbreit, & Mathur, 2015). Although functional behavior assessments may most effectively address students' problem behavior, interventions for these students need to be easily implemented by general education teachers with limited training in addressing problem behavior.

One academic intervention that effectively integrates behavioral components is Peer-Assisted Learning Strategies 2–6 (PALS; Fuchs, Fuchs, Simmons, & Mathes, 2013). PALS is a supplemental reading intervention that utilizes peer-coaching and motivational elements to improve student engagement. The teacher pairs all students by rank ordering them by reading ability, dividing the list in half, and pairing the highest ranking student in the top half of the list with the highest ranking student in the bottom half. Student pairs participate in a series of four fluency and comprehension activities using a text at the weaker reader's instructional level. PALS has been successfully adapted for implementation at the middle school level (e.g., Calhoon, 2005) and has potentially positive effects on comprehension outcomes for adolescent students (U.S. Department of Education, Institute of Education Sciences, 2012).

Sutherland and Snyder (2007) examined the effect of PALS on reading and behavioral outcomes for middle school students with emotional and/or behavioral disorders (EBD). Researchers trained a special education teacher to implement PALS in a multiple baseline across participants design to examine the effect of the intervention on students' disruptive behavior, active responding, and reading fluency. Participants included four students with EBD in a self-contained classroom. Researchers found positive effects for two participants whose disruptive behavior decreased upon implementation of the intervention. Although these results may seem underwhelming, two participants had very low rates of disruptive behavior during baseline, leaving little to no room for improvement across study conditions. Researchers found no experimental effects on student reading outcomes. In addition, study participants received special education services in a self-contained setting for students with EBD, the context of which may differ significantly from classrooms implemented by general educators that include students with and without disabilities who demonstrate challenging behavior.

The purpose of this study was to conduct a conceptual replication of Sutherland and Snyder (2007) to determine whether PALS would have a positive effect on student behavior in a less-restrictive education setting implemented by a general educator. Our rationale was this type of intervention could be easily implemented by general education teachers who serve an increasing number of students with and at risk of disabilities. Teachers have shown high levels of fidelity when implementing PALS, indicating the intervention's ease of use (McMaster, Fuchs, & Fuchs, 2006). Several procedural differences exist between the original study and the current one (see Table 1). Our research question was similar to that of the original study: Does a peer-mediated academic intervention decrease disruptive behavior and increase academic engagement for a student with high rates of disruptive behavior in an educational setting implemented by a general educator? We consulted with the first author of the original study in the planning stages of this project.

Method

Setting and Participants

The study took place from October 2016 to May 2017 within a single classroom in an urban middle school in the southeastern United States. The school enrolled approximately 600 students in Grades 5 to 8 who were White (55%), African American (35%), Hispanic (5%), and Asian or Native American (5%). Eighteen percent of the school's students received special education services and 33% of students were considered economically disadvantaged. The school's RTI procedures were not standardized and no positive behavioral intervention system was in place. No universal Tier 1 curriculum was implemented, and although the school tried to collect data and move students between tiers quarterly, RTI was not implemented systematically.

The participating teacher was a 29-year-old, White male with 3 years of teaching experience. He had a master's degree in education and certification in English Language Arts (Grades 7–12). He taught an intervention block from 3:05 p.m. to 3:50 p.m. each school day for students who qualified for Tier 2 reading supports.

The teacher selected potential student participants from his class who demonstrated frequent disruptive behavior and who scored below benchmark on the school-administered fall reading assessment. The teacher sent home consent forms to parents of selected students. Of the three students whose parents completed consent forms, two students received special education services. All three students assented to participation and were assessed on easyCBM Passage Reading Fluency (PRF) probes to determine

Table 1. Comparison of Current Study With Replicated Original.

Component	Original study (Sutherland & Snyder, 2007)	Current study
Study design	Multiple baseline across participants	A-B-A-B withdrawal
Setting	One self-contained middle school classroom for students with EBD	One intervention classroom serving students with and without disabilities with Tier 2 supports
Student participants	Four students with EBD Grades 5–7	One student without an identified disability but with frequent disruptive behavior in Grade 8
Teacher participants	One special education teacher	One general education teacher
Independent variable	Peer-assisted learning strategies with self-graphing of words read correctly per minute	Peer-assisted learning strategies with self-graphing of words read correctly per minute
Intervention implementation	Dyads within the same classroom	Classroom-wide
Intervention time	10:00 a.m. to 10:45 a.m.	3:05 p.m. to 3:40 p.m.
Data collection	Five 1-min observations across a 20-min observation session	35-min observation sessions
Student training	Not specified	Ten days of teacher-implemented student training
Dependent variables	Disruptive behavior, active responding, words read correctly and errors per minute	Disruptive behavior, academic engagement, words read correctly per minute

Note. EBD = emotional and/or behavioral disorder.

instructional reading level (Alonzo & Tindal, 2010). All three students fell below the 25th percentile on eighth-grade-level probes. Research staff completed two screening observations to confirm teacher-reported disruptive behavior. The student who demonstrated the most frequent disruptive behavior (i.e., 34 and 53 disruptive behaviors in two 15-min screening observations) was selected as the student participant. Only one student was selected for participation due to initial study design (see "Limitations and Future Directions" section).

The student, James (pseudonym), was a 13-year-old African American male in the eighth grade. Although he did not receive special education services, he had been referred for Tier 2 support through the school's RTI program (i.e., reading below benchmark on the universal screening assessment). The teacher reported frequent disruptive behavior (confirmed by screening observations) from James in the form of calling out or having loud conversations with peers when the expectation was to work quietly. He was suspended for five consecutive school days during the study for a behavioral infraction outside of the intervention classroom.

Study Design

We implemented an A-B-A-B design (Kazdin, 1982; Ledford & Gast, 2018) to assess the effect of PALS on disruptive behavior and student engagement. This design was selected because our dependent variables (i.e., disruptive behavior, student engagement) were reversible, and the withdrawal of the intervention was not anticipated to have an excessively aversive impact on the classroom teacher or the student participant. Although we began this replication with a multiple baseline across participants design to match that of the original study, several challenges elicited a change in study design (see "Limitations and Future Directions" direction).

Procedures

Prior to the start of the study, the teacher selected Tuesdays, Wednesdays, and Thursdays as intervention implementation days. For consistency, data were collected for the first 35 min of the intervention class time on these teacher-selected days across all conditions.

Baseline. Achieve3000 delivers differentiated online instruction in reading comprehension, fluency, vocabulary, writing, and foundational reading skills (Achieve3000, 2016). During baseline, the target student received business as usual instruction in his intervention class, which involved students working independently on laptops or tablets to complete lessons on a computer-based intervention program (Achieve3000, 2016; Shannon & Grant, 2015). The program is designed to incorporate rotation models including teacher-directed, small-group, and independently guided instruction. However, during the Achieve3000 sessions observed in the participating classroom, students independently worked on the computer, while the teacher circulated the room to manage behavior and answer questions, without providing extensive instructional support. Periodically, the teacher gave candy as a reward for completing independent lessons or staying on task.

Intervention. The teacher participant was trained to implement PALS procedures. Intervention began after teacher training in two phases: student training and complete PALS implementation (described next). To align with the original

study, the student participant also self-graphed his weekly PRF scores during intervention phase.

Teacher training. The third author, an experienced trainer of PALS provided an initial 4-hr training to the participating teacher. Training included an overview of the PALS evidence-base, explicit instruction, modeling, and practice of each intervention step, and an opportunity for questions. The teacher received a 30-min booster from research staff the day before he began intervention. The booster included a review of the initial training, brief practice, and opportunities to ask questions. Researchers provided the teacher with all necessary materials, including photocopies of relevant student materials, student folders, and the PALS manual. The teacher selected high-interest texts at the appropriate reading level for each student pair.

Student training. Upon beginning the intervention phase, the teacher taught his entire class PALS procedures (described below) over the course of 10 lessons, designed to last 35 min each. The teacher followed a modified training protocol to facilitate instruction for an older audience by using 10 lessons instead of the prescribed 12 and by teaching some training lessons in less than 35 min. The teacher paired students according to the guidelines outlined in the manual, using results from student reading assessments and "intuition and opinion of reading and cooperating ability" (Fuchs et al., 2013, p. xi). At the conclusion of PALS student training, the teacher began complete PALS implementation.

Complete PALS implementation. During complete PALS implementation, students sat next to each other in teacher-selected pairs at small tables. PALS lessons lasted 35 min and consisted of four activities: Partner Reading, Retell, Paragraph Shrinking, and Prediction Relay. During Partner Reading, the student with higher reading performance read aloud from a shared text (5 min), then the lower performing student read the same section of text (5 min). During Retell, the first reader asked the second reader to retell the chronological events in the text using scripted questions (2 min). During Paragraph Shrinking, the first reader began reading and the second reader stopped the first reader at the end of every paragraph to ask scripted questions to identify the main idea of the passage. At the end of 5 min, the students switched roles and repeated the process. Finally, during Prediction Relay, the first reader made a prediction about what would happen in the text before reading half a page. At this time, the pair decided if the prediction had come true, and repeated the procedures for 5 min. Students then switched roles.

During PALS, the teacher circulated to administer feedback as partners read. Across all four activities, students followed PALS procedures for error correction and awarding points. Each pair was assigned to one of the two teams to compete for class-wide points and incentives. At the end of the last PALS session each week, the teacher tallied team points and awarded one or both teams with incentives he used regularly in his classroom (e.g., candy bars or time outside).

Dependent Variables

Across phases, we used direct observation and in-vivo timed event recording to collect data on the frequency of student disruptive behavior and the duration of student engagement. These variables are similar to those used in the original study (Sutherland & Snyder, 2007).

Disruptive behavior. We defined disruptive behavior as "behavior that interrupted, or had the potential to interrupt, the instruction in the classroom" (Sutherland & Snyder, 2007, p. 107). We included the following examples of disruptive behavior: (a) calling out when the teacher's expectation was for them to quietly raise a hand, (b) throwing paper, (c) tapping their pencil on the desk, and (d) speaking out of turn in a volume above that of the rest of the class. Nonexamples included students raising their hands, asking their partner to try again, or staring at an object. Each instance of disruptive behavior was recorded as a single event. In rare instances, we counted extended, continuous disruptive behavior as multiple instances if the behavior lasted longer than 5 s (e.g., loud, sustained singing that lasted 17 s counted as three disruptive behaviors).

Academic engagement. We defined academic engagement as "observable behaviors made by students following specific instructional stimuli or passively participating in classroom activities by listening or watching." Examples included those from Sutherland and Snyder (2007; reading words orally, answering questions orally, writing words) and additional behaviors including following along in a text by scanning with eyes or turning pages at appropriate times, engaging in conversation with a peer about the content of the lesson, looking at a computer screen when directed to do so, and looking at the teacher or other designated student speaker. Nonexamples included behaviors such as staring out the window, walking across the room, looking at an unrelated book, drawing, doodling, or talking with a peer about any subject other than the content of the lesson. Per guidance from Yoder, Symons, and Lloyd (2018) regarding coding engagement, we opted to use an exhaustive code. We recorded student engagement for the full 35-min observation session. We coded students as either engaged or disengaged at all times. We switched the code to disengaged when the student maintained disengaged behaviors for 5 consecutive seconds. We switched the code back to engaged as soon as the student displayed engaged behavior. We graphed data as the percentage of the total observation session the student was academically engaged.

Observer Training

Research staff collected direct observational data using behavioral data collection software called the Multi-Option Observation System for Experimental Studies (MOOSES; Tapp, Wehby, & Ellis, 1993). All observers were students enrolled in special education programs at the same university. Observers included two second-year doctoral students, two observers in their first year of a master's program, and one undergraduate observer in her third year. Three of five observers were certified in special education and two were seeking initial certification.

The first two authors reviewed and discussed behavioral definitions for disruptive behavior and academic engagement, then coded three 15-min practice video clips to consensus. These codes became the criterion to which three additional observers were trained. The first two authors also participated in live-practice sessions in the participating classroom until reaching 85% interobserver agreement (IOA). Additional observers received a 2-hr initial training on behavioral definitions and data collection procedures, then coded three practice videos for 2 to 4 weeks until reaching 85% agreement with criterion codes on three consecutive sessions. Once observers were reliable on practice videos, they participated in live-practice sessions in the participating classroom with either the first or second author until reaching 85% IOA. Live-practice sessions also served to familiarize students in the class with the presence of two observers. Observers sat in a corner of the classroom selected by the teacher for each observation and coded behavior simultaneously and independently. Observation sessions began when the first bell rang indicating the beginning of class and ended 35 min later.

Supplemental PRF Assessment

Because components of high-quality behavior management have been associated with collateral effects on literacy skills (Gage et al., 2015), we collected fluency data to examine whether reading fluency improved over the course of the study. These data were descriptive only, as we did not expect to see a functional relation between the intervention and PRF scores (see Klingbeil, van Norman, & Nelson, 2017). Fluency is less likely to show an immediacy of effect and is not likely to return to baseline upon intervention withdrawal, both of which are required for A-B-A-B designs. In this way, our A-B-A-B study design was incompatible with reading fluency as a dependent variable (see "Discussion" section).

To assess fluency, we used easyCBM passages (Alonzo & Tindal, 2010) at the student's instructional level (i.e., seventh grade). We determined instructional level during participant screening, by identifying the grade-level passages for which student's median score fell between the 10th and 50th percentile. A member of the research team administered PRF probes in the school library between 8:50 a.m. and 9:00 a.m. every Thursday. Research staff audio-recorded and timed James reading a passage for 1 min following easyCBM procedures (Alonzo & Tindal, 2010). During baseline conditions, research staff graphed student data. After PALS was implemented, research staff trained James to self-graph PRF data for the remainder of conditions. Self-graphing was implemented as a component of the intervention to align with the original study's procedures (see Sutherland & Snyder, 2007).

IOA and Procedural Fidelity

To assess IOA, two independent observers collected in-vivo behavioral data on disruptive behavior and academic engagement for 35% of all sessions across conditions. IOA was high across sessions and conditions for disruptive behavior (M = 94.37%, range = 80%–100%) and engagement (M = 96.55%, range = 85%–100%).

We collected procedural fidelity (PF) data for 47% of all sessions across conditions (M = 94.2, range = 92%–100% across student training, intervention, and maintenance sessions, M = 0% across baseline sessions). Observers collected direct count frequency data on a researcher-created checklist based on a form used in a previous study (McMaster et al., 2014). The form defined 16 teacher behaviors (e.g., "Teacher circulates and listens to at least two pairs during Partner Reading") and 26 student behaviors (e.g., "Student pair reads from the same book"). Some behaviors were expected to occur once per session (i.e., "Teacher tells students to put away PALS materials at the end of the lesson, or students are observed putting away the PALS materials") while other behaviors were expected to occur multiple times per lesson (i.e., "Necessary transitions are kept brief"). We calculated PF as the number of observed behaviors divided by the total number of expected behaviors multiplied by 100. We used the same form in baseline and complete intervention conditions to ensure the presence of treatment procedures during intervention sessions and the absence of these procedures during baseline sessions. An abbreviated version of the PF form was used during the student training phase because not all components of the intervention were expected to be present during training days. PF forms and specific PF data across conditions are available upon request.

Social Validity

At the end of the second intervention phase, the teacher and student answered a brief questionnaire, which consisted of five Likert-type questions to assess the usefulness, feasibility, and importance of PALS. We also collected sustained use social validity data (see Ledford & Gast, 2018) via

observational maintenance sessions. We informed the teacher that these unplanned observations would occur no earlier than 2 weeks after the conclusion of the intervention, and he was free to continue implementing PALS or to stop implementation at his discretion. Sustained use social validity data (see Ledford & Gast, 2018) were collected via three observational maintenance sessions 3 weeks after conclusion of intervention phase.

Teacher and student satisfaction. On the social validity questionnaire, James indicated he liked "reading with a partner," but did not like "sharing the same book" during PALS. He also indicated he liked graphing CBM data because it "let me know what place I was at and how good I was doing and improving." James stated he would like to continue PALS 2 to 3 times per week if given the choice. When asked how much he liked PALS on a 10-point Likert-type scale with 1 representing *not at all* and 10 representing *very much*, he rated PALS as 8. James rated his regular intervention instruction as 3 on the same scale. The teacher gave the highest rating to the intervention on all five social validity questionnaire items. The teacher strongly agreed PALS was a useful, feasible intervention that made meaningful change in the target student's reading ability and classroom behavior. He also expressed interest in using PALS the following year, citing improved behavior for all students in his classroom when using PALS. During the maintenance phase, the teacher sustained the use of the intervention for one out of three sessions.

In the first maintenance session, the teacher misunderstood the option to discontinue PALS as a directive not to continue PALS. The third maintenance session was conducted in the second to last week of school in May. The teacher had instructions for PALS written on the board, but two thirds of his class did not arrive on time. Because so many partners were apparently absent, he implemented baseline conditions. Disruptive behavior and engagement mirrored baseline levels in the sessions when the teacher did not implement PALS, and intervention levels when he did implement PALS. These descriptive data indicate high levels of teacher satisfaction and low levels of feasibility in the last weeks of school.

Data Analysis

We used visual analysis (see Horner et al., 2005) as our primary method of data analysis. Visual analysis is preferable to statistical methods of analysis by single-case experts (Ledford & Gast, 2018). We considered changes in level, trend, variability, immediacy of effects, overlap, and consistency of data patterns across conditions to determine demonstrations of effect and the presence or the absence of a functional relation between independent and dependent variables.

Results

Disruptive Behavior

Figure 1 displays the frequency count of James's disruptive behaviors across observation sessions. Baseline data were high and variable, ranging from three to 179 instances of disruptive behavior. Upon implementation of student training, disruptive behaviors decreased in level and variability, ranging from three to 37 instances of disruptive behavior. These data also had a decreasing trend. In the complete PALS condition, disruptive behavior data patterns again decreased and stabilized, with a range of zero to seven instances per session. When the intervention was withdrawn, disruptive behavior immediately increased in level and variability, with a range of 85 to 116 disruptive behaviors per session. Upon reintroduction of the intervention, disruptive behavior immediately decreased in level and variability, with a range of one to three disruptive behaviors per session. Three demonstrations of the effect indicate a functional relation between PALS components and disruptive behavior for the participating student. During maintenance phase, the teacher implemented the intervention for one of the three sessions. When PALS was implemented, disruptive behavior maintained intervention levels (five disruptions). In the maintenance sessions without the intervention, disruptive behavior returned to baseline levels (68 and 61 disruptions).

Academic Engagement

Figure 2 displays the percentage of seconds in the total observation session James was academically engaged. In baseline, engagement data were variable (range = 40%–98%), with a decreasing trend. In student training, engagement remained relatively low and variable for the first four sessions, then increased to above 90% for the remaining training sessions. Engagement remained relatively high and stable during complete implementation of PALS (range = 83%–98%). Upon withdrawal of the intervention, academic engagement decreased immediately in level and increased in variability (range = 36%–74%). Upon reintroduction of the intervention, academic engagement increased and stabilized (range = 93%–98%). These data indicate a functional relation between PALS components and academic engagement for the participating student. During maintenance phase, engagement was near-intervention level when PALS was implemented (82%), but mirrored baseline levels when PALS was not implemented (range = 10%–43%).

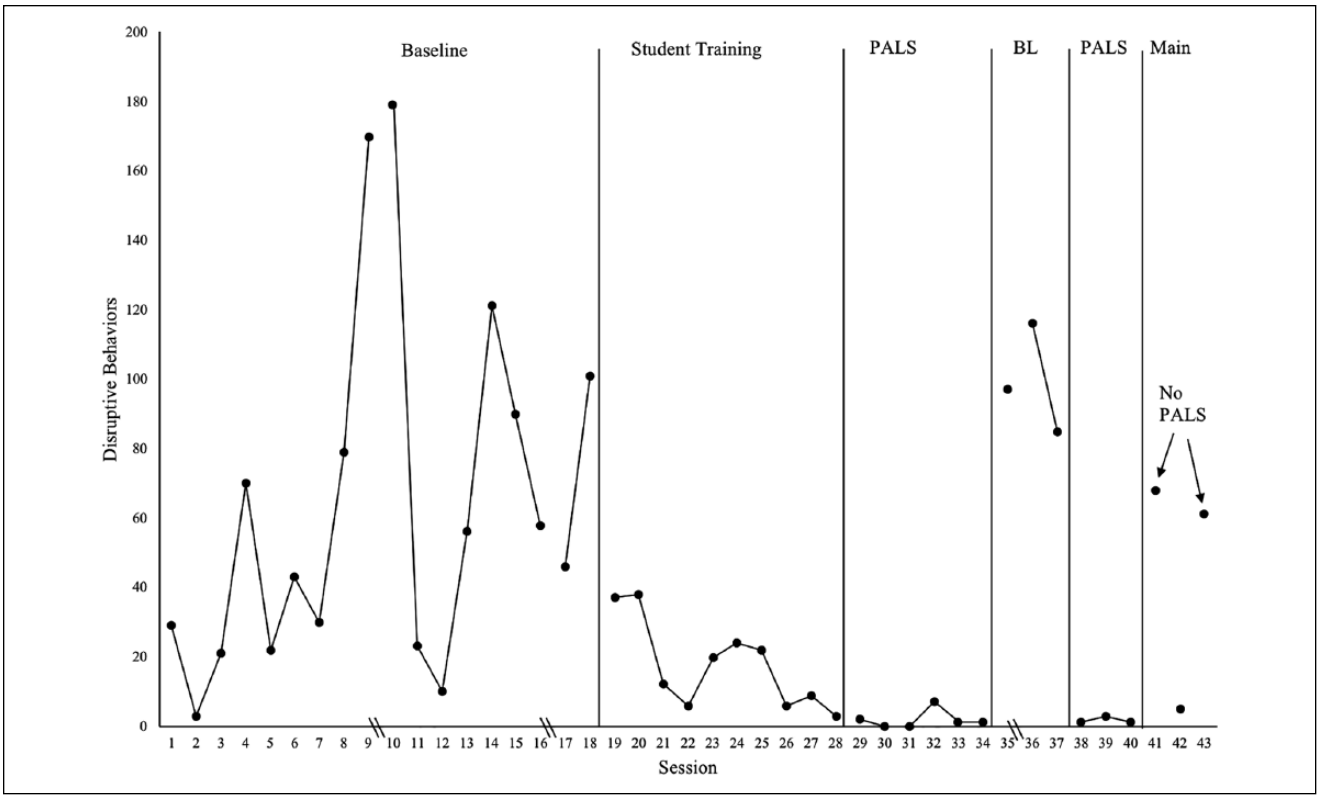

Figure 1. Number of disruptive behaviors.
Note. \\ = break between data collection points of greater than a week; PALS = complete Peer-Assisted Learning Strategies implementation; BL = return to baseline; Main = maintenance.

PRF

Figure 3 displays words read correctly per minute on weekly PRF probes for descriptive purposes only. No trend is present after PALS implementation. Data remained relatively stable across conditions. The last data point collected was 166 words read correctly per minute. This is below the highest level attained by the student before PALS implementation.

Discussion

The purpose of this study was to conduct a conceptual replication of Sutherland and Snyder (2007) to evaluate the effect of PALS on the disruptive behavior and academic engagement of a student with highly disruptive behavior. To meet these aims, we conducted an A-B-A-B single case design study in an eighth-grade intervention classroom implemented by a general education teacher providing Tier 2 supports. Data indicated a functional relation between the intervention and improvements in both disruptive behavior and academic engagement.

These results are similar to previous research demonstrating high-quality, organized instruction including elements like peer-tutoring (Bowman-Perrott et al., 2014; Kaya et al., 2015), frequent opportunities to respond, and structured instructional time have the potential to improve classroom behavior (Gage et al., 2015; Gage et al., 2018). PALS is an academic intervention that incorporates all of these structural elements to efficiently address academic and behavioral needs. Our results are also similar to those reported by Sutherland and Snyder (2007), who demonstrated two participants with the most disruptive behavior showed decreases in disruptive behavior during intervention. Our study differed from the original study in that our participant did not have an identified disability, our setting was a classroom of students with and without disabilities implemented by a general educator, and we used a different study design. Despite these differences, we consider our study a successful conceptual replication in that we found a functional relation between PALS and improved student behavior for a single student participant.

Changes to Classroom Context

Several factors may have contributed to the changes in student disruptive behavior and academic engagement seen upon implementation of PALS. Classroom context shifted significantly with the implementation of the intervention. During baseline, student learning was almost entirely

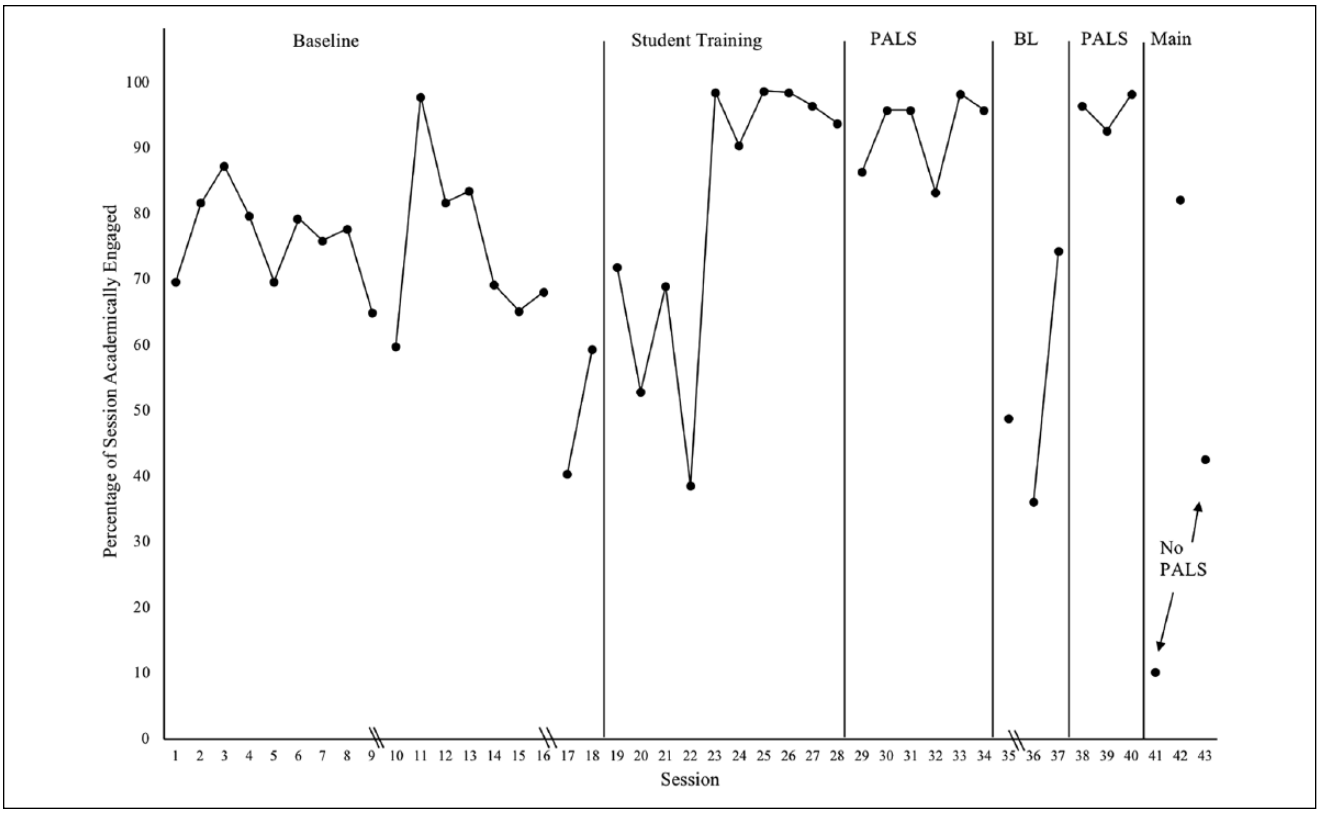

Figure 2. Percentage of seconds academically engaged per session.
Note. \\ = break in data collection of more than a week; PALS = complete Peer-Assisted Learning Strategies implementation; BL = return to baseline; Main = maintenance.

self-directed. Students logged on to a computer to complete Achieve3000 lessons and the teacher monitored. There was no accountability system in place to ensure students remained engaged with the Achieve3000 program.

Implementation of PALS increased the structure of instructional time in the classroom and gave explicit direction and purpose to each minute of class time. During each minute of the intervention, students were expected to be reading aloud, following along with their partner and coaching, or asking and answering text-based questions. As Sutherland and Snyder (2007) found, these activities were incompatible with disruptive behavior. If a student was actively engaged in the intervention, it was difficult to simultaneously be disruptive. In addition to the increased structure of instructional time, the intervention changed classroom context by increasing opportunities for peer interaction and opportunities to respond to instructional stimuli. It may be the case that these changes to classroom context inherent to the academic intervention decreased disruptive behavior and increased student engagement. This aligns with previous research finding contextual environmental and behavioral components to be effective at improving student behavior (Bowman-Perrott et al., 2014; Gage et al., 2018).

It is perhaps unsurprising that the target student's behavior changed upon implementation of the intervention because the classroom context changed so dramatically. Perhaps it was not the implementation of the specific academic intervention that changed behavior, but the implementation of high-quality, small-group instruction. Classroom structure during baseline was independent computer work. The intervention provided small-group peer learning, and the student grouping structure may have contributed to changed student behavior. Regardless, PALS represents one example of a structured academic intervention that intentionally incorporates elements to improve student engagement. It is a simple and replicable means to address behavior and academics simultaneously.

Function of Student Behavior

In addition to changes in the classroom context, changes in James's behavior could be due in part to the function of his disruptive behavior. A complete functional assessment was both beyond the scope of this study and the skill set of most general education teachers. Anecdotally, James's disruptions frequently resulted in peer attention or escape from baseline instructional demands (i.e., independent work on

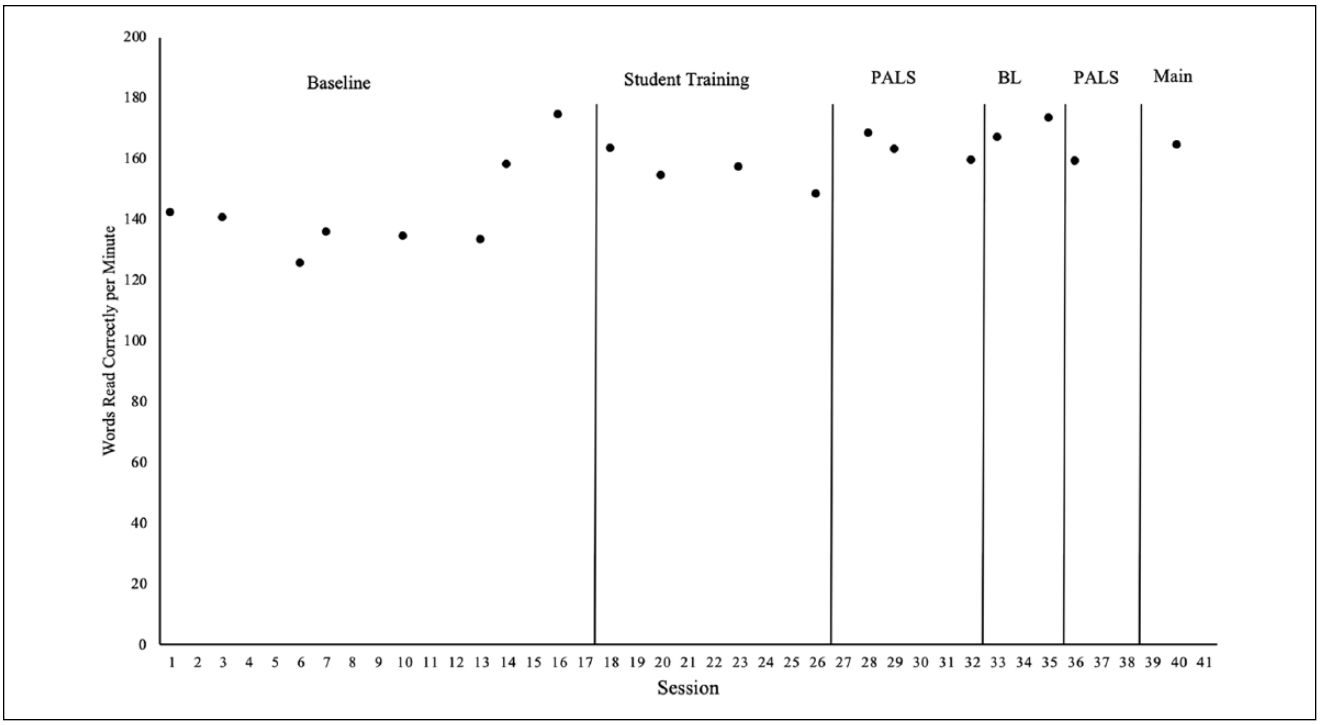

Figure 3. Words read correctly per minute on easyCBM PRF probes weekly.
Note. CBM = curriculum-based measurement; PRF = passage reading fluency; PALS = complete Peer-Assisted Learning Strategies implementation, BL = return to baseline, Main = maintenance.

the computer). PALS implementation gave James access to peer attention through participation in intervention activities. Problem behavior in this case was replaced with socially acceptable academic behaviors that served the same function: peer attention. Alternatively, the function of James's behavior could have been escape from nonengaging instructional demands. PALS replaced nonengaging instruction with engaging, structured instruction. The function of student behavior should be carefully considered alongside behavioral objectives when implementing classwide academic interventions like PALS, as such interventions may not improve behavior for students whose disruptive behavior is maintained by other functions (e.g., adult attention or escape from peers).

PRF Results

In line with results from Sutherland and Snyder (2007), no functional relation was found between the intervention and student PRF scores. No functional relation was expected due to limitations of words read correctly per minute as a measure of change in reading fluency over a short period of time. Gradual changes in trend of oral reading fluency scores can be difficult to detect and attribute to the intervention in A-B-A-B single-case designs, and any observed changes may be due to measurement error (Klingbeil et al., 2017). In addition, nine sessions may not have been enough time for PALS to enhance the participating student's reading fluency. Regardless, future studies of academic interventions that include behavioral components should measure both academic and behavioral outcomes.

Limitations and Future Directions

Several limitations may have impacted the results of this study. This study began as a multiple baseline across participants design study across four classrooms. A variety of challenges prevented completion of the original design (e.g., excessive student absences in baseline; improved student behavior during baseline due to changes in the classroom context, for example, class roster, seating arrangements; poor intervention implementation). Data for these participants are available upon request. The change in study design contributed to an extended first baseline phase that limited the number of available days for data collection in subsequent conditions. Out of 63 possible observation sessions, 19 sessions were canceled for a variety of reasons (e.g., student and teacher absences, inclement weather, special school activities). Thus, we were only able to collect three data points in several subsequent phases.

The school's approach to RTI and the small number of students in the class limited the generalizability of our results to general education classrooms more broadly. Our study investigated the impact of PALS on a single student in

a single classroom. Measuring behavior across multiple students would have allowed us to generalize results to classroom behavior as a whole. Research conducted with more participants (e.g., a multiple baseline across participants design) may help to further generalize results.

Measurement concerns constitute another limitation of this study. There are overlapping data points between the first baseline phase and student training. Many student training sessions lasted 15 to 20 min, instead of the full 35 min allotted. In those cases, though disruptive behavior remained low and academic engagement remained high during the actual training lesson, the remaining 15 to 20 min of the observation session mirrored baseline conditions (i.e., students worked independently on a computer program), disruptive behaviors increased and academic engagement decreased. As student training progressed, students learned and practiced more PALS components and training sessions lasted closer to the full 35 min. Had variability in training session length been anticipated, it would have been ideal to collect data only during time when the intervention was implemented and to calculate rate of disruptive behavior and percentage of time engaged across conditions. Although reanalysis is not possible because data were collected in vivo, our data collection system produced a conservative estimate of the intervention's effect.

Although we collected procedural fidelity data across conditions to capture elements of the intervention that may have been in place during baseline, we did not collect treatment integrity data on the implementation of Achieve3000 or on the self-graphing component of the intervention. These data would enhance understanding of the elements of the intervention present or absent across conditions. Future researchers should collect procedural fidelity data on all measurements collected across conditions. Procedural fidelity data are essential to accurately represent study conditions and evaluate the presence or the absence of a functional relation.

Implications for Practice

Teachers of students with co-occurring academic and behavioral challenges may benefit from incorporating evidence-based, peer-mediated programs into their instruction, which have potential to improve behavior in the classroom (Bowman-Perrott et al., 2014; Kaya et al., 2015). PALS may not be effective in reducing the problem behavior of all students. However, PALS is an effective, efficient method for providing structured, supplemental reading instruction through a class-wide delivery model in an inclusive setting. Incorporating a program like PALS into Tier 1 or Tier 2 instruction may allow schools to target additional resources to students who need more intensive and individualized interventions (e.g., data-based individualization; NCII, 2013).

The results of this study also speak to the importance of a structured classroom environment with specific student roles, activities, and time limits. Implementation of PALS changed the environment of the classroom for all students. Expectations for PALS included tasks that were incompatible with disruptive behavior. Teachers might consider elements of their own instruction that could change the classroom environment, including increased opportunities to respond, positive feedback, and structured, well-organized classroom environments.

As more students with persistent and concomitant academic and behavioral challenges participate in RTI programs in the general education setting, it is important to consider how to best prepare general and special education teachers to address students' specific needs. Teachers need instruction in evidence-based interventions that can be implemented easily in class-wide settings. Ideally, teachers should learn interventions that address both academic and behavioral concerns. Training in evidence-based practices for struggling students could be especially important for general educators in the current educational environment that promotes inclusivity and tiered supports before students receive special education services.

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