EFFECTS OF MULTILEVEL COACHING ON TEACHERS' IMPLEMENTATION OF OPPORTUNITIES TO RESPOND AND STUDENT ACADEMIC ENGAGEMENT

by

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A dissertation submitted to the faculty of
The University of North Carolina at Charlotte
in partial fulfillment of the requirements
for the degree of Doctor of Philosophy in
Special Education

Charlotte

2021

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ABSTRACT

HOLLY NICOLE NIEDERMEYER JOHNSON. Effects of Multilevel Coaching on Teachers'
Implementation of Opportunities to Respond and Student Academic Engagement. (Under the
direction of DR. YA-YU LO)

As a result of various academic, behavioral, and social-emotional challenges that
adolescents may experience during high school, an alarming rate of students are not acquiring
their high school credentials. To address this concern, researchers have suggested dropout
prevention efforts should focus on using a comprehensive, preventative, tiered framework such
as Schoolwide Positive Behavior Interventions and Supports to target alterable classroom-level
variables such as student behavior, student attendance, academic performance, and student
engagement. One of the most efficient and effective methods for improving academic
engagement and student behavior is through the implementation of evidence-based classroom
management practices, such as increasing students' opportunities to respond (OTRs) during
teacher-directed instruction. Unfortunately, many teachers lack adequate amounts of training in
these practices. In a single-case, multiple baseline design across two teacher participants, this
study investigated the effects of multilevel professional development (PD) and coaching support
provided by a school-based coach on high school teachers' use of a trained classroom
management skill (i.e., OTRs) during teacher-directed instruction. Overall results showed
teachers improved implementation fidelity but failed to achieve the required rates of OTRs.
Additionally, when teachers improved implementation fidelity, students also demonstrated
increases in active academic engagement. Social validity data indicated teachers and the school's
instructional coach rated the multilevel PD and coaching framework to be moderately effective
in supporting teachers' implementation of high rates of OTRs. Student participants reported

observed increases in teachers' use of a variety of OTRs, positive feelings associated with actively participating in class when presented with increased OTRs, and a better understanding or retention of course content when teachers used high rates of OTRs. Limitations of the study, implications for practice, and suggestions for future research are discussed.

ACKNOWLEDGMENTS

First, I would like to acknowledge my dissertation committee members. To Dr. Ya-yu Lo, thank you for the support, guidance, and understanding you provided throughout the doctoral program as my advisor and as the chair of my dissertation committee. Your demonstration of excellence in teaching, research, and mentorship has set a standard by which I will continue to strive to achieve throughout my career. I am extremely grateful for the opportunity to have been your advisee and for all the effort you put forth in preparing me for the road ahead. Next, to Dr. Charles Wood, thank you for your continued encouragement and investment in helping each of us pursue our goals. I am truly grateful for the time you have spent sharing your expertise with me and look forward to drawing upon that wisdom in the future. To Dr. Robert Pennington, it has been an absolute honor and a privilege to learn from you and to work alongside you over the course of the program. Thank you for always sharing your astute knowledge with me and for being willing to engage in thought provoking conversations that always leave me wanting to know more and to do better as an educator and researcher. To Dr. Clare Merlin-Knoblich, please know how much I value and appreciate your willingness to share your knowledge and expertise with me throughout this dissertation year. Your kind words and feedback have been a source of encouragement and have helped to positively shape this experience for me.

Next, I would like to thank the faculty in the Department of Special Education and Child Development. In particular, I would like to extend my gratitude to Dr. Charles Wood and Dr. Ya-yu Lo for accepting me as a recipient of the Leadership grant specializing in multi-tiered interventions that funded my Ph.D. traineeship. If it were not for your support, achieving this goal would not have been possible. To Dr. David Test, thank you for imparting your wisdom and for always challenging me to think more critically about how I can make a difference in the lives

of students. In addition, thank you to Dr. Donna Sacco for your guidance and support, and for demonstrating the importance of service in improving outcomes for educators and students. I also want to thank all the instructors of the course work I experienced during the program, as you all have been vital in shaping my career moving forward. To the colleagues in my cohort, who have now become family, and to those who have come before and after, thank you for the support, encouragement, publication opportunities, data collection, and shared celebrations throughout this journey.

In addition, I would like to extend a special thank you to Dr. Shawnee Wakeman for the opportunity to work with and learn from you as your graduate research assistant. Your dedication to teaching, research, and improving outcomes for students with disabilities is unmatched. I am extremely grateful for your guidance and mentorship and aim to follow the exemplar of leadership you have set in the future.

Finally, I would like to acknowledge all the teacher participants, student participants, school staff, and data collectors that made this study possible. Thank you for your dedication, flexibility, and collaboration during a time in which you were called to be more than educators, but rather true superheroes.

DEDICATION

First, I would like to dedicate this dissertation to my family. Thank you for all for your unwavering support and for believing in me even when I may not have shared that same level of confidence in myself. A special thank you to my dad, for being an exemplar of hard work and determination and for instilling that same work ethic in me. I am also very appreciative of the countless hours you spent over the last three years serving as my sounding board and editor-in-chief, even though I'm pretty sure these were not roles for which you willingly volunteered. To my mom, I will forever be grateful to you for always serving as a model of enthusiastic optimism, perseverance, and for being my constant reminder to not take life so seriously. To my parents, a thank you will never be enough to truly convey how appreciative I am that not only were you there for me during this journey, but that you were also there to support my husband and our daughter. During this time, you have served in many roles beyond that of parents and grandparents, and for that I will forever be in your debt, which I know could never be repaid in a single lifetime.

Second, without the support and unconditional love of my husband, this amazing experience and final product would not have been possible to achieve. Thank you for your ongoing display of patience, continued encouragement, and for the hard work you put into helping me attain my goals.

Finally, to our children, Kinley Jean and Easton, you are the greatest accomplishment of all. It is because of you two that I continue to push myself beyond perceived limits and strive to move mountains. Always remember, it's an adventure, and I am beyond grateful that I get to experience it with you.

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CHAPTER 1: INTRODUCTION

Statement of the Problem

High school dropout rates present great concerns for public education (Kemp, 2006; Phelan, 1987). High school dropout and lower than desired graduation rates continue to remain a top priority for educators, policymakers, and communities (Freeman & Simonsen, 2015; Freeman et al., 2015; Lehr et al., 2003). Due to an increasing demand for a more educated workforce, economic and social consequences have continued to escalate for those who do not complete high school (Freeman & Simonsen, 2015; Rumberger, 2011; Swanson & Editorial Projects in Education, 2009). Adolescents who do not obtain high school credentials are at an increased risk for encountering a variety of challenges and are more likely to receive public welfare, face unemployment or underemployment, engage in criminal activities, and experience mental health problems (Belfield & Levin, 2007; Freeman & Simonsen, 2015; Jia et al. 2015; Rumberger, 2011; Swanson & Editorial Projects in Education, 2009). As a result, these probable outcomes are substantial at the individual level and potentially carry a considerable economic societal cost (Belfield & Levin, 2007; Catterall, 1987; Freeman & Simonsen, 2015).

Reviews of dropout prevention literature have indicated that to address factors associated with dropout, schools have historically used accelerated and reactive interventions that focus on either school-based programs implemented at the high school level just before a student drops out or recovery programs implemented after the student has already chosen to leave a traditional secondary setting (Freeman & Simonsen, 2015; Freeman et al., 2015). Unfortunately, these interventions have been unsuccessful in significantly lowering the dropout rate (Hickman et al., 2008). A possible reason these interventions did not lead to reduction in the dropout rate is

because they did not take into consideration that dropping out is typically the result of sustained

disengagement from the students while in school (Freeman et al., 2015; Jimerson et al., 2000).

Hammond et al. (2007) conducted a comprehensive review of the literature from 1980 to

2005 to determine the risk factors and conditions that were found to increase the likelihood of

students dropping out of school. The authors found that dropping out of school is the result of a

variety of factors that can be categorized in four areas or domains: (a) individual, (b) family, (c)

school, and (d) community factors. The authors then designated each of these domains as risk

factors that were considered alterable or status (unalterable) based on the extent to which the

identified variables could be influenced to change students' trajectory of dropping out.

Recognizing the likelihood that a student's dropping out increases when multiple risk factors are

present, Hammond et al. recommended that schools target alterable classroom-level variables

such as student behavior, student attendance, academic performance, and student engagement in

an effort to prevent and intervene in high school dropout (Freeman et al, 2015).

To address alterable variables in dropout prevention, researchers recommend considering

the implementation of a comprehensive, preventative, tiered approach to promoting positive

school climate, and reducing identified risk factors (Freeman et al., 2015; Lee & Burkam, 2003;

Lehr et al., 2003; Mac Iver, 2011; Mac Iver & Mac Iver, 2010). One evidence-based, data-

driven, systematic framework for addressing student needs and improving student outcomes is

Schoolwide Positive Behavioral Interventions and Supports (SWPBIS; Freeman et al., 2016;

Gage et al., 2015). When implemented with fidelity, SWPBIS has led to enhanced overall school

climate, reductions in disciplinary violations, and improvements in attendance and academic

outcomes (Freeman et al., 2015; Sugai & Horner, 2008), which are all proximal and statistically

significant risk indicators that have been shown to be associated with high school dropout.

Furthermore, as a result of sustained implementation fidelity, schools implementing SWPBIS also have experienced marginally statistically significant declines associated with dropout rate (Freeman et al., 2015).

SWPBIS

SWPBIS is a systems-level framework that is used to systematically coordinate the implementation of evidence-based practices (EBPs) within and across instructional settings to maximize behavioral and academic outcomes for students (Freeman et al., 2019; Horner et al., 2010). EBPs are instructional strategies that have acquired substantial empirical support and have been shown to produce socially significant student outcomes (Cook & Cook, 2011). Grounded in behavioral principles, SWPBIS uses a function-based system to align school and student needs within a tiered continuum of supports (Freeman et al., 2019; Horner & Sugai, 2015). This continuum ranges from all students accessing and receiving universal systems and practices (Tier 1), to the delivery of targeted small-group supplemental instruction (Tier 2), and increasingly intensive individualized instruction and supports (Tier 3) for students who continue to demonstrate behavioral challenges despite receiving robust and layered universal and supplemental supports (Flannery et al., 2014).

Research has shown evidence supporting the effectiveness of SWPBIS implementation on positive outcomes related to improved overall school climate, an increase in students' demonstration of prosocial behaviors, improved academic achievement, and an increase in active student engagement (Chitiyo et al., 2012; Flannery et al., 2013, 2014; Gage et al., 2019; Horner et al., 2010; Mitchell et al., 2018; Solomon et al., 2012). However, a majority of this research has focused on elementary and middle school settings (Algozzine, et al., 2011; Bradshaw et al., 2008, 2009, 2010, 2015; Freeman et al, 2019; Horner et al., 2009) with limited research

addressing high schools (Flannery et al., 2013). Although suitable for high school settings, SWPBIS has not been implemented to the same extent, at the same rate, or to the same level of fidelity as it has been in elementary and middle schools (Flannery et al., 2009). This may be due to contextual differences at the high school level such as school size, student development levels, and the prioritization of academic growth, which make SWPBIS implementation more difficult in high schools (Flannery & Kato, 2017).

As indicated previously, dropout has been associated with extended periods of disengagement for students (Freeman et al., 2015; Jimerson et al., 2000) that include events such as negative interactions with adults and peers, limited interest in academic content, and lack of active participation in their learning (Goss & Andren, 2014). To support high school students in maximizing attendance, sustained engagement, and academic and social outcomes, it is important to develop efficient and effective methods that can address the barriers high schools face when implementing SWPBIS as a proactive way to address the dropout crisis (Flannery & Kato, 2017). According to Goss and Andren (2014), sustained disengagement is most prevalent at the classroom level. Investigating classroom-level outcomes associated with critical components of universal instruction within a SWPBIS framework could (a) address sustained student disengagement, (b) improve students' display of prosocial behaviors, (c) provide methods for removing barriers to the implementation of SWPBIS at the classroom level, and (d) promote implementation of SWPBIS across instructional settings at the high school level.

Classroom Management

As a core component of SWPBIS, the framework uses prevention logic to organize proactive and comprehensive teaching approaches to deliver behavioral support to all students within a school setting. Given that students spend a majority of their instructional day in

classroom settings, SWPBIS emphasizes the importance of establishing universal classroom supports that are designed to ensure effective instructional design and delivery (Simonsen & Myers, 2014). Highly effective classroom instruction is dependent upon a strong classroom management foundation that encourages and maintains appropriate student behavior, increases academic engagement, and subsequently, academic achievement (Gage et al., 2017; Stronge et al., 2011). Traditionally, schools have relied on reactive policies to manage student behavior instead of using a proactive and comprehensive teaching model that supports students in developing appropriate prosocial behaviors (Menzies et al., 2017). Several studies measuring the influence of teacher behavior and classroom context on the behavioral and academic outcomes for students showed that students identified as demonstrating challenging behaviors received less instruction, fewer instances of teacher praise, and fewer opportunities to respond (Simonsen et al., 2014; Sutherland et al., 2008; Sutherland & Oswald, 2005). For example, Pas et al. (2014) examined the effects of teachers' use of positive (i.e., meaningful participation, opportunities to respond, behavior specific praise) and negative (i.e., disapproving statements, reactive behavior management strategies) classroom management strategies on high school students' behavior. Based on the observational data from 52 high schools across the state of Maryland, Pas et al. found that classrooms with increased inconsistency and noncompliance of classroom expectations had less student engagement and more social disruptions (e.g., verbal aggression, off-task conversations, bullying) when compared to classrooms where students consistently met expectations. Conversely, in classrooms where teachers provided students with positive classroom management strategies (i.e., increased opportunities to respond, more positive recognition for student behavior, fewer disapproving statements, minimal uses of reactive

behavior management strategies), students consistently demonstrated prosocial behavior and met established expectations.

Additional research also has shown that poor classroom management can be associated with students receiving more reprimands, elevated experiences in exclusionary discipline practices that increase in frequency and intensity over time, and experiences that result in fewer satisfying relationships with peers and teachers (Menzies et al., 2017; Mitchell & Bradshaw, 2013; Simonsen et al., 2014). Teachers who are able to effectively manage their classrooms are able to maximize student engagement and increase the likelihood of academic success (Simonsen et al., 2014). Therefore, as an essential component of effective teaching, classroom and behavior management practices are critical for all teachers and students (Simonsen et al., 2010).

Opportunities to Respond

Increasing opportunities to respond (OTRs) is one effective classroom management practice that has been associated with increased rates of on-task behavior (Haydon et al., 2013), improvements in students' fluency and automaticity of basic skills across content areas (Lane et al., 2015), decreased rates of classroom disruption (Sutherland & Wehby, 2001), and its capability to be used as a formative assessment of student understanding (Commons et al., 2020; Lane et al., 2015). According to Greenwood et al. (1984), an OTR is "the interaction between (a) teacher formulated instruction (e.g., teacher prompt is given, question is asked, signal is provided to encourage response) and (b) its success in establishing the academic responding desired or implied by materials, the subject matter goals of instruction" (p. 64). Teacher-directed OTRs invite or solicit student response through verbal (e.g., answering a question), gestured (e.g., raising their hand if they agree with a statement), or written (e.g., writing a response) formats (Simonsen et al., 2010). Studies have shown that by providing students with high rates of OTRs,

teachers can create safe and predictable learning environments that foster increased student engagement, active student participation, increases in the number of correct responses, and consequently a reduction in inappropriate student behaviors (Whitney et al., 2015). In a literature review examining the presentation of multiple modes of teacher-directed OTR (e.g., choral responding, response cards), MacSuga-Gage and Simonsen (2015) found that increased rates of OTRs were associated with positive outcomes for all students, including increased student participation, on-task behavior, and correct responses, as well as decreases in disruptive and off-task behaviors.

In the most recent review of teacher-directed OTRs, Common et al. (2020) examined the effectiveness of OTR strategies during whole-group instruction across the K-12 continuum. Findings suggested that across the 21 studies that were included in the review, OTRs were presented by teachers as an integral part of general classroom management (e.g., Armendaiz & Umbreit, 1999) and as an additional support for students at risk for emotional and behavioral disorders (EBD; e.g., Haydon et al., 2010). Employing a modified definition for methodologically sound studies (i.e., 80% or more weighted criterion; Lane et al., 2009), Common et al. found a majority (52.38%) of studies examining various OTR strategies (e.g., response cards, choral responding) were identified as methodologically rigorous and effective. Common et al. also found teacher-directed OTRs to have a large magnitude effect in a therapeutic direction. Therefore, when used in K-12 school settings, authors classified teacher-directed OTRs as a potential EBP.

Traditionally, common teaching practices at the high school level typically include lecturing and individual assessment, which often limits the use of high rates of OTRs and increases risk factors associated with dropout. Increased OTRs can help address dropout risk

factors by promoting student learning through interactive lessons that maintain appropriate pacing, provide students with varied opportunities for active participation, and monitor student understanding (Pas et al., 2014). For example, Adamson and Lewis (2017) investigated the effects of three OTR strategies (i.e., guided notes, class-wide peer tutoring, response cards) on the academic engagement time of three high school students with disabilities within the general education setting. Using an alternating treatments design, Adamson and Lewis randomized the order of selected OTR strategies during each 90-min class period. Findings from this study showed that all three OTR strategies were effective in improving overall levels of academic engagement and in reducing disruptive behaviors. Despite the importance of effective classroom management practices, such as OTRs, teachers typically receive limited instructional support in these areas (Simonsen et al., 2010). Based on the insufficient amount of preparation and training a majority of teachers receive related to effective classroom management, there is a critical need for the implementation of in-service professional development and continued coaching support (Mitchell et al., 2017). This need also becomes particularly beneficial for educators at the high school level, as these teachers are faced with assisting students in the timely accrual of credits toward graduation and ensuring students are prepared for outcomes associated with college, career, and community readiness.

Professional Development and Coaching

Even with the emphasis paid to EBPs, there is still a gap between research evidence in classroom management practices and classroom implementation (Cook & Schrimer, 2006; Denton et al., 2003; Wood et al., 2016). Many educators enter the field with little (if any) training in classroom management (Begney & Martens, 2006; Simonsen et al., 2014) and continue to experience difficulties with classroom management while attempting to balance

instructional and managerial demands (Lane et al., 2005; Simonsen et al., 2014). Traditionally, school leaders (e.g., district and school level administrators, school psychologists, school counselors, department/team leads, veteran teachers, instructional and behavioral specialists) are often the only direct support for struggling teachers (Simonsen et al., 2014). Thus, there is a need to provide school leaders with efficient and effective training supports that are designed to develop and improve teachers' existing classroom management skills (Simonsen et al., 2014). Specifically, it is important to support individuals serving on the SWPBIS team (i.e., school leaders) with training supports as they may naturally take the role of supporting teachers with classroom management skills (Simonsen et al., 2014).

Professional development (PD) can be defined as opportunities to engage in structured professional learning that results in a change in adult behavior (e.g., knowledge, skills, practices) and improvements in students' academic, behavioral, and/or social-emotional outcomes (Darling-Hammond et al., 2017). When provided, PD can equip educational teams and teachers with additional knowledge and skills to use evidence-based classroom management practices (Wood et al., 2016). Unfortunately, Boardman et al. (2005) found many teachers have limited access to high quality PD opportunities geared towards classroom management strategies, such as OTRs, that are designed to meet the needs of a majority of students within instructional settings. Most often, PD is delivered using a singular session, in-service approach that is relatively passive, provides few opportunities to achieve skill fluency through practice, and provides little to no feedback on skill use (Myers et al., 2011). A sufficient amount of research also has indicated that these types of training sessions rarely result in maintained teacher practices (Cohen & Ball, 1999; Elmore, 2002; Fixen et al., 2005; Myers et al., 2011; Yoon et al., 2007).

Given that in-service training alone has been found to be insufficient in supporting teachers' use of newly acquired classroom management practices (Wood et al., 2016), research suggests the use of coaching within multicomponent PD models (e.g., explicit training, coaching, and performance feedback used collectively) as vital means to improving outcomes associated with the implementation of effective classroom management practices (Simonsen et al., 2020). Coaching is defined as the supportive interactions and activities conducted by a content expert (e.g., researcher, consultant, university faculty lead facilitator, skilled teacher peer) following initial training that increases the automaticity and rigor with which practices are implemented with fidelity in typical settings (Kretlow & Bartholomew, 2010; Massar, 2017; Massar & Horner, 2015). A combination of PD and coaching has been firmly supported throughout the literature (e.g., Joyce & Showers, 1980, 1982; Knight, 2009; Kretlow et al., 2011; Randolph et al., 2020). Research has shown that both teacher investment in content delivered during PD and support for implementation of EBPs must be present to effectively address the gap between PD and classroom implementation (Randolph et al., 2020). Coaching presents continued opportunities to support teachers in enhancing and refining current skills, along with effectively implementing and sustaining newly acquired instructional practices following initial PD (Cornett & Knight, 2009; Counts, 2019; Fixsen et al., 2005; Gilmour et al., 2017; Joyce & Showers, 2002; Kretlow & Bartholomew, 2010; Mitchell et al., 2017; Randolph et al., 2020; Reinke et al., 2014).

Improving teacher effectiveness and implementation of EBPs has been one of the primary focuses of most school-based studies examining the impact of coaching (e.g., DiGennaro et al., 2007; Filcheck et al., 2004; Jager et al., 2002; Kohler et al., 1997; Kretlow et al., 2011, 2012; Randolph et al., 2020; Stitcher et al., 2006). For example, researchers have applied coaching to support teachers' use of OTRs. Randolph et al. (2020) investigated the effects of live, remote

coaching sessions (i.e., iCoaching), as part of a comprehensive PD and coaching package, where researchers delivered prompts using bug-in-ear (BIE) devices to increase teacher-directed OTRs. During instructional sessions that lasted an average of 10 min, researchers provided teachers with coaching prompts pertaining to OTRs via an iPod and Bluetooth earpiece. Once received, teachers immediately delivered the OTR to the specific student mentioned in the coaching comments. Findings suggested that iCoaching produced positive outcomes associated with teacher-directed OTRs and increased levels of student response. Furthermore, teacher participants reported that having both PD and coaching on OTRs helped to increase their knowledge and support effective practice implementation.

Multilevel Professional Development and Coaching

Within any coaching model, the amount of support provided to teachers plays an important role in the effectiveness of coaching. Specifically, research suggests coaching models with 30 or more hours of direct support following the initial training are essential to produce successful outcomes on teachers' use of effective classroom management practices (Garet et al., 2001; Grasely-Boy et al., 2019; Yoon et al., 2007). Reinke et al. (2014) evaluated the relationship between coaching supports and implementation of classroom management practices (i.e., behavior specific praise and use of precorrective statements) with 52 elementary teachers. Participants in this study were involved in six 6-hour workshops throughout the duration of the school year, in addition to one individual coaching session up to 1-hour per week. During the coaching session, teachers received specific feedback on implementation fidelity, coaches modeled effective practices, teachers engaged in demonstrations of how to address potential barriers to the delivery of instruction, and coaches supported specific action plan development. Findings suggested that teachers receiving the 42-hour training and coaching support program

(i.e., six 6-hour workshops and 1-hour weekly coaching sessions) demonstrated an increase in their use of targeted proactive classroom management strategies.

Despite the importance and effectiveness of intensive coaching support with at least 30 contact hours, a program that contains this level of time and resource commitment may be difficult for a majority of schools to implement (Gage et al., 2018; Grasley-Boy et al., 2019). Furthermore, when presented with a range of teacher skills within a single setting, it may be likely that not all teachers will need the same level of support nor is it feasible for all schools to invest such a significant amount of support on a regular basis (Gage et al., 2018; Goodnight et al., 2019; Grasley-Boy et al., 2019). Multilevel PD is a proposed method of enhancing the feasibility and efficiency of designing and delivering PD on evidence-based classroom management practices that includes ongoing embedded coaching supports (Grasley-Boy et al., 2019).

Multilevel PD is a data-driven systematic model that uses intensifying levels of PD and coaching support to increase teachers' use of research- and evidence-based instructional practices (Darling-Hammond et al., 2017; Grasley-Boy et al., 2019; Owens et al., 2020). An expanding research base continues to examine the effects of multilevel support on teachers' use of evidence-based strategies. Examples of this research include studies by Myers et al. (2011) and Schnorr (2013) that both evaluated the effects of a data-driven, response-to-intervention (RTI) delivery approach that included three levels of intensifying intervention. Results from both studies confirmed previous research noting initial training alone was insufficient in creating desired effects and that performance feedback based on classroom performance resulted in improved teacher behavior. Findings also suggested that PD was directly tied to classroom practice data and included demonstrations and opportunities for practice, as well as follow-up

opportunities for support in the form of coaching as part of a multilevel system of support (Wood et al., 2016).

Multilevel PD and coaching also has been applied to supporting teachers' implementation of effective classroom management strategies. Simonsen et al. (2014) conducted a study to explore the effects of a multitiered support framework on the use of a specific classroom management practice (i.e., specific praise) with four middle school teachers. The multitiered support framework focused on (a) brief training and self-monitoring (Tier 1) instruction for all teachers and (b) enhanced self-management for teachers who did not respond to Tier 1. Using a multiple baseline across settings (class periods) design, researchers demonstrated a functional relation between Tier 1 supports and increased specific praise for one teacher, and a potential relation for another teacher. Conversely, two teachers did not respond to Tier 1 supports; however, potentially positive effects existed when enhanced self-management was implemented in combination with coaching prompts. These results further confirmed that teachers can benefit from varying levels of classroom management support.

Sanetti and Collier-Meek (2015) extended this line of inquiry and evaluated the effects of increasingly intensive implementation supports on treatment integrity of six elementary school teachers. Implementation supports were delivered within a Multi-Tiered Implementation Supports (MTSS) framework aimed to facilitate decisions about efficient and effective strategy use. Results of the nonconcurrent multiple baseline across implementors design indicated all teachers responded to the supports, but the magnitude of response varied across teachers. This suggests that implementers may require varying types and intensities of support to be successful.

More recently, Gage et al. (2017) conducted two studies to examine the effects of the multitiered system for professional development (MTS-PD) model on elementary school

teachers' use of behavior specific praise (BSP). The MTS-PD model was designed to differentiate levels of PD support for teachers based on observed needs. In the first study, the researchers used a pre-post case study design to identify a relationship between teachers' implementation of BSP and universal PD and the results indicated that teachers did not increase their rates of BSP to a priori defined levels of success following a 30-min universal PD session. Results from the first study were then used to identify teachers who were eligible for targeted PD in the second study. Using a multiple baseline across subjects design to examine the effects of targeted PD on teachers' implementation of BSP, researchers found that increases in teachers' use of BSP was related to receiving an additional layer of support. Collectively, results from these two studies suggested that (a) universal PD supports alone may be insufficient in meeting the learning needs of all teachers and that (b) targeted PD can increase teachers' use of specific evidence-based classroom management skills.

Although a considerable amount of research has examined the effects of coaching on the implementation of various evidence-based classroom management practices, there has been relatively limited research on coaching using school personnel as implementers as it applies to these strategies at the high school level. Furthermore, to date, there have been no studies that have examined the use of multilevel PD and coaching, in-person or virtual, at the high school level.

Statement of Purpose and Research Questions

To extend current literature on multilevel PD and coaching, the purpose of this study was to investigate the effects of multilevel training and coaching support provided by a school-based coach on high school teachers' use of a trained classroom management skill (i.e., OTRs) during

daily instruction within the SWPBIS framework. More specifically, this study aimed to address the following primary research questions:

1. What are the effects of post-PD multilevel coaching provided by a school-based coach on high school teachers' implementation fidelity of OTR within daily teacher-directed instruction?

2. To what degree does post-PD multilevel coaching provided by a school-based coach that is intended to promote teachers' implementation of OTRs increase active student engagement for high school students?

This study also will address the following secondary research questions:

3. What are the perceptions of the instructional coach on the importance, acceptance, and effectiveness of multilevel PD and coaching in supporting high school teachers' implementation of OTRs and in increasing students' active engagement?

4. What are the perceptions of teachers on the importance, acceptance, and effectiveness of multilevel PD and coaching in supporting their implementation of OTRs and the effects of OTRs on active student engagement of high school students?

5. What are the perceptions of high school students on the usefulness and effectiveness of teachers' implementation of OTRs during teacher-directed instruction?

Significance of the Study

This study will contribute to the limited research on the use of a multilevel PD and coaching framework in several ways. First, this investigation will extend previous studies by confirming the use of an efficient, low-cost evidence-based classroom management practice that can improve academic engagement and promote desirable student behavior during direct instruction. In doing so, this study also has the potential for contributing to dropout prevention

literature as academic engagement is considered a risk indicator associated with high school dropout. Second, this study will provide support for the systematic delivery of OTRs and further examines appropriate rates of OTRs at the secondary level. Third, it will add to limited research on the implementation of a multilevel PD and coaching framework for use in high schools to support teachers' implementation of EBPs. Similarly, this study will provide additional empirical evidence on the use of varying levels of support on teachers' delivery of OTRs. Finally, this study will provide initial evidence on the effects and feasibility of using a school-based coach as the primary interventionist to support teachers in improving effective delivery of OTRs within instructional environments.

Delimitations

This study investigated the effects of multilevel training and coaching support provided by a school-based coach on high school teachers' use of a trained classroom management skill (i.e., OTRs) during daily instruction. It is important to note this study was limited by the following decisions: (a) this study included only a small group of teachers and students in a selected high school; (b) teacher selection was initially based on principal recommendation (rather than universal screening); (c) outcomes addressed focused on teacher implementation, with a secondary examination on active student engagement; and (d) the study was implemented in a high school that has an identified person who is responsible for providing PD and coaching support to teachers (must have had a specified amount of time serving in that role or a similar role). Additionally, I provided training to the selected systems level personnel remotely due to restrictions associated with COVID-19 and all observations were conducted via a web-based conferencing system. Therefore, generalization of results to students and settings beyond those included in the study are limited.

Definition of Terms

The following terms will be important to understand within the context of this study. Definitions of these terms are provided.

Active Student Response

Active student response is "an on observable response made to an instructional antecedent, which occurs when a student emits a detectable response to ongoing instruction" (Heward, 1994, p. 286). Active student response includes behavior such as oral reading, writing, asking questions, academic talk, answering questions, and physical behaviors involved in participating in academic tasks (e.g., pointing to discriminate one word from another, presenting flash cards; Greenwood et al., 1984). Active student response is used to increase student engagement during teacher-directed instruction.

Classroom Management

Classroom management, including both instructional and behavioral management, uses integrated teacher behaviors to create, implement, and maintain a positive and meaningful learning environment (Egeberg et al., 2016).

Coaching

Coaching is defined as the supportive interactions and activities conducted by a content expert (e.g., researcher, consultant, university faculty lead facilitator, skilled teacher peer) following initial training that increases the automaticity and rigor with which practices are implemented with fidelity in typical settings (Kretlow & Bartholomew, 2010; Massar, 2017; Massar & Horner, 2015).

Dropout Prevention

Dropout prevention is the active pursuit and implementation of effective methods that have been shown to reduce risk factors associated with dropout and enhance outcomes for individual students, families, schools, and communities by directly influencing future educational and economic events (Goss & Andren, 2014).

Evidence-based Practices

Evidence-based practices (EBPs) are instructional strategies that have acquired substantial empirical support and have been shown to produce socially significant student outcomes (Cook & Cook, 2011). These empirically validated practices are rigorously examined and evaluated based on four fundamental elements: research design, quantity of research, quality of research, and magnitude of effect related to supporting empirical evidence (Cook & Cook, 2011).

High School Dropout

High school dropout is considered as any student who chooses to leave school for any reason before graduation or completion of a program of studies without transferring to another secondary school (Bonneau, 2007).

Implementation Fidelity

Implementation fidelity refers to the degree to which programs or interventions are delivered as intended by the developers (Carroll et al., 2007).

Multi-tiered Systems of Support

Multi-tiered systems of support (MTSS) provides a framework for schools to align a continuum of academic and behavioral evidence-based practices that are (a) considered universal (Tier 1) and delivered to all students, (b) targeted (Tier 2) and delivered to groups of students

with a common target skill area, and (c) intensive and individualized (Tier 3) and delivered to individuals with the most significant need (State et al., 2019).

Multilevel Professional Development and Coaching

Multilevel professional development (PD) and coaching is a data-driven systematic model that uses intensifying levels of PD and coaching support based on needs to increase teachers' use of research- and evidence-based instructional practices (Darling-Hammond et al., 2017; Grasley-Boy et al., 2019; Owens et al., 2020).

Opportunity to Respond

An opportunity to respond (OTR) is "the interaction between (a) teacher formulated instruction (e.g., teacher prompt is given, question is asked, signal is provided to encourage response) and (b) its success in establishing the academic responding desired or implied by materials, the subject matter goals of instruction" (Greenwood et al., 1984, p. 64).

Professional Development

Professional development provides opportunities to engage in structured professional learning that results in a change in adult behavior (e.g., knowledge, skills, practices) and improvements in students' academic, behavioral, and/or social-emotional outcomes (Darling-Hammond et al., 2017).

School-wide Positive Behavior Interventions and Supports

School-wide Positive Behavior Interventions and Supports (SWPBIS) is an evidence-based three-tiered framework used to improve and integrate all of the data, systems, and practices affecting student outcomes (Horner et al., 2010).

Sustained Disengagement

Sustained disengagement refers to a continuation of internal and external factors across periods of transition for students over time that weaken or distract a student from the importance of school completion (Goss & Andren, 2014).

Virtual Environment

Virtual environments are defined as technology-based environments that allow knowledge sharing and interactions between individuals and provide access to a vast range of resources (Wilson, 1996).

CHAPTER 2: REVIEW OF LITERATURE

This chapter consists of a review of the literature pertaining to School-wide Positive Behavior Interventions and Supports (SWPBIS) and the implementation of this systematic, multitiered framework at the high school level, the effects of an evidence-based classroom management practice (namely, Opportunities to Respond [OTRs]) on student academic engagement and behavior, and the use of multilevel professional development and coaching frameworks that have been shown to produce positive effects on teachers' implementation of evidence-based instructional practices. Figure 1 displays the logic model that serves as the foundation for this review of the literature.

Figure 1

Logic Model
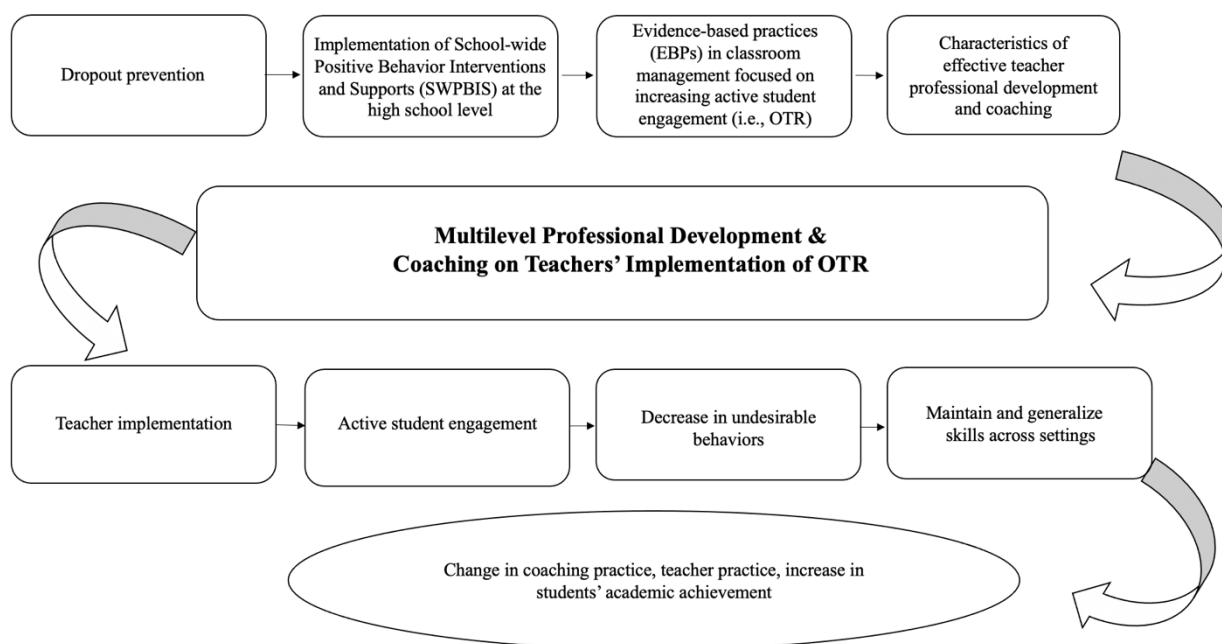
The first section of the literature review includes an explanation of high school students, dropout prevention efforts, and a discussion of SWPBIS, its effects, and the limited SWPBIS research at the high school level. The second section addresses the importance of evidence-based classroom management practices, specifically examining the use of OTRs to increase student academic engagement and display of prosocial behaviors during direct instruction. The final section presents literature on professional development (PD), coaching, and the use of multilevel PD and coaching within a multitiered systems of support (MTSS) framework.

High School Students and SWPBIS at the High School Level

For many students, high school is a significant and impactful time in their educational career; however, it can be a time when many adolescents encounter academic, behavioral, and social-emotional challenges (Flannery et al., 2014). There is evidence to support that during high school, many students experience (a) difficulties in establishing a sense of connectedness to school, (b) negative interactions with teachers and peers, (c) adversity in achieving academic requirements, and (d) negative outcomes associated with previous events of grade retention, which are all variables that have shown to be directly correlated with a lack of student motivation, disengagement, and increased rates of absenteeism (Flannery et al., 2014; Goss & Andren, 2014; Reschly & Christenson, 2006; Scanlon & Mellard, 2002). As a result of these challenges, an alarming rate of high school students (ages 16 to 24 in grades 9 through 12) are dropping out of school. A review of high school completion and dropout rates in the United States during the 2017-2018 school year (most recent data available) revealed 85% of high school freshmen graduated with a regular diploma within 4 years of starting ninth grade (National Center for Education Statistics [NCES], 2020). This means approximately 15% of all public high school students failed to graduate. Although the high school completion rate has

improved by 10% since 2009, a gap in the graduation rate for students who were identified as culturally and linguistically diverse (CLD; Black, Hispanic, Asian/Pacific Islander, American Indian/Alaska Native) still remained showing below the national average, with 79% of Black, 81% of Hispanic, and 74% of American Indian/Alaskan Native students graduating from high school (NCES, 2020). Furthermore, it is estimated that 7,000 students drop out of high school daily, averaging over 1 million students who choose to leave high school every year without a diploma (Alliance for Excellent Education, 2010; Goss & Andren, 2014).

Current graduation rates continue to confront individuals, schools, districts, states, and the nation with considerable adverse social and economic outcomes (Goss & Andren, 2014). Research has shown that adolescents who do not obtain high school credentials are at an increased risk for encountering a variety of challenges and are more likely to receive public welfare, face unemployment or underemployment, engage in criminal activities, and experience higher rates of physical and mental health problems (Belfield & Levin, 2007; Freeman & Simonsen, 2015; Jia et al., 2015; Rumberger, 2011; Swanson, 2009). Furthermore, the social and economic consequences for students who do not obtain high school credentials will continue to increase as the demands for a highly skilled and educated work force become more prevalent (Freeman & Simonsen, 2015). According to the average annual earnings for 25- to 34-year-old young adults in 2018 who obtained full time employment year around, an employee with less than a high school diploma grossed $27,900 (NCES, 2020). Conversely, the average annual earnings for 25- to 34-year-olds in 2018 who obtained full time employment year around and had completed high school was $34,900 (NCES, 2020). In addition, during periods of economic recession, research also has shown that high school graduates are more likely to locate and maintain employment (Goss & Andren, 2014). Despite these sobering statistics about the effects

of high school dropout, it is possible to remove barriers to completing high school and achieving postsecondary educational outcomes. Specifically, an emerging research base has demonstrated positive outcomes associated with the use of early warning indicators to identify students who may be at risk for dropping out as well as potential solutions for addressing and decreasing this concerning trend (Frazelle & Nagel, 2015; Goss & Andren, 2014).

Research on Dropout Prevention

A large volume of research has been dedicated to identifying the characteristics and associated risk factors of students who choose to drop out of high school (e.g., Dynarski & Gleason, 2002; Finn; 1989; Freeman & Simonseon, 2015; Kortering & Braziel, 1999; Hammond et al., 2007; Mann, 1986; Prevatt & Kelly, 2003; Rumberger, 1995, 2011; Rumberger & Rotermund, 2012). As a result of this research, dropping out of high school has been found to be a multifaceted process of disengagement from school that often begins early in a student's educational career, rather than the outcome of a single impulsive event (Bost & Riccomini, 2016; Goss & Andren, 2014). Hammond et al. (2007) conducted a comprehensive review of risk factors associated with dropout and summarized risk factors in four domains: individual, family, community, and school. Present within each of these domains were identified factors that Hammond et al. categorized as either status (unalterable) or alterable. Status and alterable factors were selected based on the degree to which prevention or intervention strategies could be used to reduce impact the factors may have on a student's decision to drop out. Status factors were defined as external factors that are extremely difficult and potentially impossible to alter through the implementation of school-based programs, and included age, gender, parental education and employment, native language, socioeconomic status [SES], mobility, family structure, and ability or disability (Hammond et al., 2007). Alterable factors were defined as factors that can be altered

or changed through the use of various types of instructional strategies and schoolwide

programming, and included academic failure, attendance, misbehavior, retention, and early

aggression (Hammond et al., 2007). As an extension of the work conducted by Hammond et al.,

further research has shown that although it is difficult to establish a direct causal link between

any one specific risk factor and dropping out, the probability that a student will drop out

significantly increases when numerous risk factors are present (Freeman & Simonsen, 2015;

Freeman et al., 2015; Lan & Lanthier, 2003; Lee & Burkam, 2003; Neild, 2009; Neild et al.,

2008; Roderick & Camburn, 1999; Suh & Suh, 2007). As a result of the often intractable nature

of status risk factors identified by Hammond et al., alterable variables have been established as

the primary focus of dropout prevention efforts aimed at increasing student engagement and the

likelihood of students completing school (Freeman et al., 2015; Goss & Andren, 2014).

Dropout has been associated with extended periods of disengagement for students

(Freeman et al., 2015; Jimerson et al., 2000) that include events such as negative interactions

with adults and peers, limited interest in academic content, and lack of active participation in

their learning (Goss & Andren, 2014). Previous reviews of dropout literature have indicated

schools traditionally employ a reactive approach to student dropout by implementing (a) school-

based programs at the high school level just before a student leaves or (b) recovery programs

after a student has left the traditional high school setting (Dynaski & Gleason, 2003; Freeman &

Simonsen, 2014; Freeman et al., 2015; Lehr et al., 2003; Prevatt & Kelly, 2003). Data reflecting

current graduation rates suggest these approaches may be inadequate, and even ineffective in

reducing student dropout. Because repeated exposure to negative events such as poor interactions

and disengagement in academic learning increases the likelihood students will experience

academic and behavioral challenges, a systematic, tiered, and preventative approach to

improving school climate and reducing risk factors has been proposed as a way to address the dropout crisis (Freeman et al., 2015; Lee & Burkam, 2003; Lehr et al., 2003; Mac Iver, 2010, 2011). When schools use a comprehensive framework focused on preventatively addressing numerous risk factors simultaneously to successfully engage students in the school community, it is possible to reduce the need for reactive and intensive re-engagement strategies at the secondary level (Byrk & Thum, 1989; Coie et al., 1992; Freeman et al., 2015).

To aid in the implementation of a multicomponent intervention to prevent dropout, school practitioners and policy makers have access to resources such as dropout intervention guides (e.g., Dynaski et al., 2008; Frazell & Nagel, 2015; Hammond et al., 2007; Rumberger et al., 2017; Schargel & Smink, 2001) that provide a comprehensive synthesis of research and expert opinions on planning and executing dropout prevention strategies. These guides include information specific to such topics as the collection, organization, and analysis of schoolwide data that can be used to support the early identification of students who may be at risk for school failure and effective evidence-based practices (EBPs) targeted to comprehensively addressing schoolwide reform and challenges associated with preventing dropout. However, these resources do not include additional context or information regarding the efficient, effective, and sustainable integration of components such as these within a comprehensive systems-based framework (Freeman et al., 2015; Mac Iver, 2010). One proactive, systematic, MTSS framework that has been shown to be effective in reducing factors associated with student dropout is SWPBIS.

SWPBIS

SWPBIS is a systems-level framework that is used to systematically coordinate the implementation of EBPs within and across instructional settings to maximize behavioral and academic outcomes for students (Freeman et al., 2019; Horner et al., 2010). Grounded in

behavioral principles, SWPBIS uses a function-based system to align school and student needs within a tiered continuum of supports (Freeman et al., 2019; Horner & Sugai, 2015). Aimed at altering outcomes within the school environment through enhanced systems, data-based decision making, and implementation of EBPs, key features of SWPBIS include the use of multitiered prevention logic, rigorous use of universal screening and progress monitoring, and the application of a continuum of support (Bradshaw et al., 2014). Interventions within a SWPBIS framework are framed within three tiers of support (Bradshaw et al., 2009; Horner et al., 2005; Sugai & Horner, 2006). As a basic preventative support, all students receive instruction that emphasizes prosocial skills and universal behavioral expectations. In addition to this support, students may fluidly move within the tiers of instruction resulting in increasingly intensive interventions that are appropriately matched to students' needs based on varying sources of data (Horner et al., 2010). The three tiers of instruction within a SWPBIS framework are universal prevention (often referred to as primary prevention or Tier 1), targeted supports (secondary interventions, supplemental interventions, or Tier 2), and intensive supports (tertiary prevention, individualized supports, or Tier 3). The implementation of each tier of instruction is guided by specific practices and systems features which are driven by data and intended to produce specific socially significant outcomes for students (Horner et al., 2010).

Multitiered Supports

Universal Prevention. Universal prevention is a proactive schoolwide instructional approach for all students and staff across all instructional settings; it is designed to (a) explicitly define behavioral expectations for faculty members, (b) provide instruction to all students on behavioral expectations, (c) provide students with opportunities to practice expectations and receive specific feedback, (d) frequently reinforce student performance that either meets or

exceeds the identified schoolwide expectations, and (e) provide a continuum of logical consequences to address undesirable behaviors (Horner & Sugai, 2000; Horner et al., 2010; Sugai et al., 2010). Schools implementing SWPBIS organize their evidence-based behavioral and instructional practices and systems within an integrated continuum where students receive layered support based on their response to instruction. The goal of universal prevention within a SWPBIS framework is to improve the academic and behavioral outcomes of at least 80% of students through the delivery of effective, efficient, relevant, and sustainable instructional and behavioral practices and organizational systems that are driven by data and used to establish the social culture and continuum of behavior supports needed to achieve academic and social success for all students (Horner et al., 2010; Sugai et al., 2009). Additionally, universal prevention includes the collection and examination of data pertaining to problem behavior. School teams regularly summarize these data and use the data to support instructional decision making. According to Horner et al. (2010), systems features at the universal prevention level include team organization, data use to guide implementation, and the incorporation of initial and ongoing SWPBIS training as a part of annual professional development.

 Targeted Supports. Targeted supports are designed to meet the behavioral needs of students (i.e., typically 5-15% of students) who are not responding to universal supports and who continue to demonstrate at-risk behaviors across settings (Simonsen & Myers, 2015). Students receiving targeted supports continue to participate in universal instruction. In other words, targeted instruction is not meant to supplant universal instruction, but rather to provide an additional layer of support to help students access instruction pertaining to universal prevention efforts (Horner et al., 2010). According to Horner et al. (2010), targeted support practices are conceptualized as efficient behavior change interventions that are implemented in a similar

manner to a small group of students who have all been identified as experiencing similar instructional and/or behavioral challenges. Systems features within this layer of support include using data to identify students who may benefit from specific targeted instruction and progress monitoring of all students receiving supplemental instruction (Horner et al., 2010). Additionally, data collection at this level occurs more frequently so that instructional decisions can be made quickly if a student is not responding adequately to targeted supports as predetermined by an identified instructional team (Horner et al., 2010). In addition to collecting progress monitoring data at the targeted support level, the instructional team is charged with selecting targeted interventions that appropriately align to student needs and monitoring the fidelity of implementation across all instructional groups and for specific individual students (Horner et al., 2010).

Intensive Supports. Intensive supports are designed to meet the instructional needs of a small group of students (i.e., 3-5% of students) whose behavior has not responded to universal and targeted supports within a school setting and who continue to engage in high-risk or chronic problem behaviors (Horner et al., 2010; Simonsen & Myers, 2015). When planning for intensive supports, more formalized assessments are used to appropriately align interventions to the function of the student's behavior (Sugai & Horner, 2010). These assessments may require a substantial amount of time and resources and require trained experts to guide the development and implementation of the interventions (Horner et al., 2010). Functional behavioral assessments (FBA) are generally conducted at this level of support to determine elements in the environment that are affecting a student's behavior. Furthermore, results of the FBA are combined with additional sources of academic and social data to develop a comprehensive behavior support plan for the student (Horner et al., 2010). Even though intensive support plans typically include

multiple components, students receiving support at this level should continue to have access to universal prevention efforts. As with targeted supports, intentional layering of individualized instruction should include schoolwide behavioral expectations and rules. Additionally, intensive supports require frequent progress monitoring to ensure a student is making adequate growth and to confirm the intervention is being implemented with fidelity (Horner et al., 2010).

Theoretical Underpinning of SWPBIS

SWPBIS was founded on the theory of behavior analysis, an approach that has demonstrated empirical support across various fields, including psychology and education (Simonsen & Myers, 2015). Emerging from early scientific inquiries of observable events, the theory of behavior analysis began to evolve as advances in the area of natural sciences were made. Examination of the relationship between behavior and environmental factors began in the early 20th century, when psychologists observed predictable and replicable interactions between behavioral consequences and the methodological manipulation of immediate environmental events (Sugai & Horner, 2010). One particular psychologist, B. F. Skinner, further advanced inquiry in this area in the 1930s by applying a scientific approach to the study of behavior (Skinner, 1938; Sugai & Horner, 2010). During this time, Skinner advanced research in this area by adopting rate as a standard measure of behavior (i.e., number of behaviors per minute), developing objective descriptions of behavior, using varying methods of assessment (i.e., continuous, formative) as a way to describe behavior over time, and applying a measurement system to developing a better understanding of human behavior (Sugai & Horner, 2010). Furthermore, Skinner's investigative procedures and experimental approach provided a powerful demonstration of systematic and reliable functional relations between behavior and various types of environmental stimuli (Cooper et al., 2020). The early contributions Skinner made to the field

of social sciences served, and continues to serve, as the foundation for the application of behavioral theory as a means for improving human behavior (Sugai & Horner, 2010).

Beginning in the 1960s, the use of behavior principles to address socially significant questions and problems concerning one's behavior became apparent, thus initiating the start of applied behavior analysis (ABA; Baer et al., 1968). During this time, psychologists began using the principles of ABA to reduce classroom disruptions, predelinquent antisocial behavior, self-injury, stereotypy/self-stimulation, and other forms of "abnormal" behavior (Alberto & Troutman, 2007; Cooper et al., 2007; Ferster & DeMyer, 1961, 1962; Sugai & Horner, 2010; Thompson & Grabowski, 1972). ABA began to expand on the theoretical foundation of behavioral theory (e.g., reinforcement, stimulus control) by specifically targeting the application of socially significant human behaviors (Baer et al., 1968), leading to the documentation of the effects of numerous behavioral (e.g., token economy, behavior contracting, response cost, differential reinforcement; Cooper et al., 2007; Sugai & Horner, 2010; Wolery et al., 1988) and academic instructional practices (e.g., direct instruction, precision teaching, curriculum-based measurement; Sugai & Horner, 2010).

The study and application of ABA principles were further advanced in the 1970s and 1980s when researchers began considering the larger context for which behavioral interventions were selected, implemented, and evaluated (Sugai & Horner, 2010). Positive behavior supports (PBS) expanded ABA by bringing awareness and consideration to elements of social validity (i.e., goals, procedures, outcomes; Sugai & Horner, 2010). In its early years of inception, PBS focused on improving outcomes for individuals with autism, intellectual disability, and severe developmental disabilities; however, when it was associated with positive outcomes, it was also

applied to meet the needs of individuals with emotional and behavioral challenges, mental health support needs, and significant academic deficits (Sailor et al., 2009; Sugai & Horner, 2010).

General application and acceptance of ABA and PBS were initially limited due to their firm association with special education and supporting individuals with disabilities; however, a turning point came in the 1980s when ABA and PBS principles were expanded into general education settings as an effective, efficient, and relevant way of addressing individual student behavior within a larger social and educational context (Sailor et al., 2009; Sugai & Horner, 2010; Sugai et al., 2000). Researchers at the University of Oregon began conducting a series of applied demonstrations, research studies, and evaluation projects that indicated a need for schools to place greater attention on prevention efforts, the use of research-based practices, data-based decision making, schoolwide systems, explicit social skill instruction, team-based implementation and professional development, and student outcomes (Biglan, 1995; Colvin et al., 1993; Horner et al., 2010; Lewis & Sugai, 1999; Mayer, 1995; Sugai & Horner, 2002).

Around the same time, Hill Walker and colleagues (1996) proposed the adoption of a multitiered disease prevention framework which was guided by several principles, including sound conceptual theory, prevention, effectiveness, efficiency, relevance, durability, and access to all. The logic supporting this model began with defining an organization's most highly valued outcomes (e.g., math, writing, reading, social behavior), and then identifying the smallest number of evidence-based systems and practices needed to achieve desired outcomes with at least 80% of the target populations (Horner & Sugai, 2015). At the end of the 20th century, not only were these principles being used as an application model for many technical assistance agencies and implementation activities, but they became the guiding framework for the development of SWPBIS (Sugai & Horner, 2010).

Grounded in behavioral theory, ABA science, and PBS values, SWPBIS is designed to be applied in a manner that is considerate of local influences (cultural and contextual), addresses documented needs and outcomes of all stakeholders, is sustained by implementers, uses empirically supported practices, and is driven by data-based action planning and decision making (Safran & Oswald, 2003; Sugai & Horner, 2009, 2010; Sugai et al., 2000). The impact of behavior analysis on the application of SWPBIS is most evident when examining (a) the focus placed on operationally defining behavior and intervention elements, (b) the logic model used to select evidence-based interventions that will be applied to produce socially significant outcomes through the altering of student and staff behavior, and (c) an overarching commitment to measuring both implementation fidelity and effects of EBPs within a SWPBIS framework on students outcomes (Horner & Sugai, 2015). Furthermore, SWPBIS can be characterized based on three specific features: four-element integration (i.e., systems, data, practices, outcomes), evidence-based behavioral interventions, and continuum of behavior support (Sugai & Horner, 2002, 2010; Sugai et al., 2000). Within the SWPBIS framework, outcomes represent what is needed or desired based on data; practices are what have shown to be effective, efficient, relevant, and sustainable in achieving desired outcomes; systems identify what critical components need to be in place to support the adoption of a practice along with the accurate, fluent, sustained, and relevant implementation of that practice; and data provide context to the fidelity of practices and systems and the effects they have on desired outcomes (Sugai & Horner, 2006).

With the reauthorization of the Individuals with Disabilities Education Act (IDEA) in 2004, an intentional effort was made to enhance educational decision making by placing an emphasis on student performance as an indicator of instructional effectiveness (Sugai & Horner,

2006). The reauthorization included a focus on the use of scientifically based instruction and interventions and was referenced as *responsiveness to intervention* (RtI; Bradley et al., 2007; Burns et al., 2005; Fuchs et al., 2003; Gresham, 2005; Gresham et al., 2005; Sugai & Horner, 2006). As a framework for structuring teaching and learning environments that are relevant, effective, efficient, and accessible to all students, educators, and families (Sugai & Horner, 2006), RtI includes six defining characteristics: (a) universal screening, (b) data-based decision making and problem solving, (c) continuous progress monitoring, (d) student performance, (e) continuum of evidence-based interventions, and (f) implementation fidelity (Sugai & Horner, 2006). Given SWPBS is directly reflective of the six characteristics that define the RtI framework, it is an exemplar for how a multitiered framework can be applied to support increases in the demonstration of prosocial behaviors within the context of schools (Horner & Sugai, 2015; Sailor et al., 2009; Sugai & Horner, 2008, 2009).

Evidence to Support the Implementation of SWPBIS

SWPBIS remains as an advancing framework for systemically supporting the implementation of evidence-based systems and practices and continues to be refined through empirical research. SWBPIS is currently being implemented in over 27,000 schools across the United States with a substantial body of research supporting its effectiveness in reducing challenging behavior, disciplinary actions, and office discipline referrals (ODRs), and in improving overall school climate and safety, students' academic achievement, and organizational health (Bradshaw et al., 2008, 2009, 2010, 2014; Childs et al., 2016; Gage et al., 2016; Horner et al., 2009, 2010; Lassen et al., 2006; Sadler & Sugai, 2009; Simonsen et al., 2012; Solomon et al., 2012; Waasdorp et al., 2012). For example, Gage et al. (2019) examined the effects of SWPBIS on the disciplinary actions of 593 regular, public schools in Florida. The researchers used a

quasi-experimental design to compare disciplinary actions among schools implementing and not implementing SWPBIS. Results indicated schools implementing SWPBIS had significantly lower out-of-school suspensions (OSS), with an effect size for OSS that was well above the What Works Clearinghouse's (WWC; 2014) criteria for being considered substantively important ($d > .25$). In addition to reducing the total number of OSS, findings from this research also demonstrated statistically significantly fewer OSS for both students with disabilities and Black students in schools implementing SWPBIS with fidelity.

Furthermore, Bradshaw et al. (2008) examined the association between the training and implementation of SWPBIS and overall school climate, using data from a group-randomized controlled effectiveness trial in 37 elementary schools. Results indicated training in SWPBIS had a significant effect in staff's reporting of schools' resource influence, academic emphasis, staff affiliation, and overall organizational health. After conducting sensitivity analyses, Bradshaw et al. found that positive intervention effects across several aspects of organizational health achieved significance by the third year of implementation and were sustained through the end of the 5-year trial. Findings from this study suggest that training and implementation of SWPBIS can be associated with positive outcomes in schools' overall climate and organizational health and may potentially improve overall academic and behavioral outcomes for students and staff.

In addition to individual studies, several reviews and meta-analyses exist that examined the evidence base of SWPBIS. First, Horner et al. (2010) conducted a literature review of peer-reviewed articles published between 2000 and 2009 that included primary-source experimental analyses of SWPBIS to investigate results that directly addressed the implementation and effectiveness of SWPBIS. Researchers used five criteria to examine the evidence base of integrated practices within the three tiers of SWPBIS by determining if (a) practice and

participants were operationally defined with precision, (b) research included valid and reliable measures, (c) research was grounded in rigorous designs, (d) research documented experimental effects without negative outcomes, and (e) study documented effects. Results from this review of literature indicated there was sufficient empirical support to classify SWPBIS as an evidence-based practice and to warrant large-scale implementation. However, Horner et al. also noted the criteria they used to examine the research base on SWPBIS was applied to the topic collectively rather than to individual studies. By doing so, the researchers acknowledged that applying the criteria to individual studies may yield a more accurate assessment of the evidence base supporting SWPBIS.

To expand on the work of Horner et al. (2010) and further assess the evidence base supporting SWPBIS, Chitiyo et al. (2012) conducted a literature review to examine the extent to which SWPBIS should be considered evidence based. Unlike Horner et al., Chitiyo and colleagues applied the proposed criteria to individual studies. Chitiyo et al. included 10 studies that met the inclusion criteria between the years 1990 and July 2011. Results from this research demonstrated that only 2 of the 10 studies (i.e., Bradshaw et al., 2010; Horner et al., 2009) met all five criteria for determining SWPBIS as an evidence-based practice. Even though most studies in this review (a) defined the independent variable with operational precision that would allow for replication, (b) used a combination of measures to evaluate outcomes, and (c) maintained acceptable measures of implementation fidelity, there were only a limited number of studies that reported high fidelity and were grounded in rigorous designs. Based on the results from this literature review, Chitiyo et al. acknowledged SWPBIS has demonstrated a level of efficacy that is noteworthy to promoting its use within schools.

In another study, Solomon et al. (2012) conducted a meta-analysis to investigate the effects of SWPBIS across various school environments, time frames, and outcome variables spanning 16 years (i.e., 1993 to 2008) and 20 articles. Researchers conducted an online search using multiple databases (e.g., PsycINFO, Educational Resources Information Center [ERIC]) to identify either studies that were published in peer-reviewed journals or published dissertations that included the following criteria: (a) study examined "Positive Behavior Support" by both explicitly defining and examining at least one individual component, (b) study used SWPBIS rather than individual supports, (c) study's primary focus was change in student behavior over time, (d) study was conducted using a single-case design, (e) study included data that were displayed in graphic form and a sufficient number of data points were available to calculate a regression line, and (f) study was conducted in English. Outcomes from the reviewed studies indicated the use of multiple tiers of support within a SWPBIS framework were moderately effective in reducing students' problem behavior and increasing desired behavior in schools. Although results from this study were promising in terms of increasing generalizability of findings associated with the implementation of SWPBIS, Solomon et al. noted two limitations: (a) small number of studies evaluating SWPBIS beyond the elementary level and (b) the lack of implementation evaluation beyond that of Tier 1or universal supports. Therefore, Solomon et al. indicated future research should be conducted to further examine the effectiveness of SWPBIS in secondary educational settings, while also conducting a more in-depth review of the individual essential practices and systemic components within the framework.

Further, Mitchell et al. (2018) conducted a review of extant literature in an effort to (a) identify and summarize existing group comparison designs of SWPBIS, (b) apply current review standards to existing studies, and (c) address conclusions regarding the evidence base for

SWPBIS found in previous reviews (i.e., Chitiyo et al., 2012; Horner et al., 2010). The authors

applied both the WWC and the Council for Exceptional Children (CEC) standards across five

individual, group design studies to evaluate outcomes associated with the implementation of

SWPBIS. Results from this research indicated that when provided with adequate training in

components of SWPBIS, school teams were able to meet minimal implementation standards.

Furthermore, schools that were identified as meeting implementation criteria also experienced

positive outcomes associated with staff perceptions, school climate, student behaviors, and/or

overall implementation fidelity of universal components of SWPBIS. For this review, authors

only allowed inclusion of experimental group comparison design studies. Among the

experimental group studies identified, there were no direct measures of SWPBIS on school, staff,

or student outcomes, rather the measures focused primarily on evaluating the impact of training

as it related to implementation fidelity. Based on this information, the use of adapted WWC

standards indicated there was sufficient evidence to acknowledge training in SWPBIS as an EBP.

The application of CEC standards, however, indicated there was no sufficient evidence to

consider training in SWPBIS as an EBP because the CEC evaluation process did not allow for

evaluating the interactions of training within the implementation of SWPBIS as a

multicomponent intervention.

Finally, Noltemeyer et al. (2019) conducted a comprehensive synthesis of the existing

literature base in order to identify the (a) general quantity, quality, and type of research being

conducted in relation to SWPBIS; and (b) overall magnitude of the relationship between these

variables across studies. Guided by a framework from Lipsey and Wilson (2001), published (e.g.,

peer-reviewed journal articles) and nonpublished (e.g., book chapters) material were eligible to

be considered for the study if they (a) documented the impact of SWPBIS on at least one

outcome variable, (b) involved participates attending a school in grades preschool through 12 at the time data were collected, (c) reported either pretest and posttest measures on at least one outcome or reported and compared at least one outcome to a school not implementing SWPBIS, (d) included quantitative research designs that were implemented without extreme methodological flaws, (e) were reported in English, and (f) had been conducted since 1990. A total of 50 studies and 55 cases (some manuscripts included more than one study) were included in the synthesis. Of the studies that were analyzed, key findings indicated that a majority of cases were single descriptive studies, that included reports on implementation data, and that involved diverse populations across elementary or multigrade educational settings within the United States. Furthermore, Noltemeyer et al. indicated that findings revealed a majority of cases that included statistical significance testing reported unanimously positive or predominately positive findings related to behavioral outcomes for students. Noltemeyer et al. also acknowledged notable limitations in the literature such as the impact of SWPBIS in secondary settings and the effects of this framework on student achievement overtime. Therefore, authors suggested future research should be conducted using rigorous research designs that further investigates these limitations.

In sum, numerous individual studies, literature reviews, and meta-analyses have examined the evidence base of SWPBIS (e.g., Horner et al., 2010; Noltemeyer et al., 2019). As an empirically supported framework, SWPBIS guides the systemic implementation of evidence-based systems and practices that haven been shown to decrease students' challenging behavior and schools' use of exclusionary discipline practices, increase students' display of prosocial behaviors, improve overall school climate and organizational health, and potentially improve students' academic achievement.

SWPBIS at the High School Level

As indicated previously, the majority of research examining the effects of SWPBIS has been focused on elementary and middle school settings (Algozzine, et al., 2011; Bradshaw et al., 2008, 2009, 2010, 2015; Freeman et al., 2019; Horner et al., 2009). Although suitable for high school settings, SWPBIS has not been implemented to the same extent, at the same rate, or to the same level of fidelity as it has been in elementary and middle schools (Flannery et al., 2009). This may be due to contextual differences at the high school level such as school size, student development levels, and the prioritization of academic growth at the secondary level (Flannery & Kato, 2017).

Unique Characteristics of High School

Current estimates suggest that at least 3,369 high schools across all 50 states are actively implementing SWPBIS (Flannery et al., 2018), accounting for only 13% of the total number of schools implementing SWPBIS (National Technical Assistance Center on PBIS, 2018). Although the specific reasons contributing to the slow adoption rates by high schools remain imprecise, research has shown traditional implementation strategies used at the elementary level neglect to take into consideration the unique characteristics of high schools (Flannery et al., 2009, 2013; Putnam et al., 2009). Evidence suggests the implementation of SWPBIS at the high school level may take longer to reach fidelity and sustainability as a result of three specific contextual characteristics: school size, student developmental level, and an organizational culture that prioritizes academic growth (Flannery et al., 2013; Flannery & Kato, 2017; Freeman et al., 2019; Swain-Bradway et al., 2015). These unique characteristics have been shown to directly affect SWPBIS implementation at the high school level by impacting the key foundational

systems of data, leadership, and communication (Flannery & Kato, 2017). Therefore, it is pivotal these characteristics are strategically examined at the high school level.

School Size. High schools are vast, complex organizations that consist of large student enrollment and faculty/staff populations (Flannery & Kato, 2017; Flannery et al., 2009, 2018). To efficiently and effectively provide faculty, staff, and students with systematic support, high schools often employ the use of an administrative team rather than a single administrator (Flannery & Kato, 2017). In this model, each administrator typically shares different aspects of the school's leadership (e.g., discipline, curriculum, athletics), which can potentially cause conflicts in the coordination and complexity of schoolwide implementation efforts (Flannery & Kato, 2017). With multiple people organizing various elements of systems support, it is critical that each person within the administrative team is informed and has a clear understanding of the directions, priorities, and messages that is being shared with faculty, staff, and students regarding SWPBIS implementation, and is aware of their individual role in facilitating this work (Flannery et al., 2018).

Additionally, high schools are typically organized according to departmental or curricular content areas. This organizational structure provides high schools with the opportunity to maximize content expertise and to communicate more efficiently and effectively among faculty (Flannery & Kato, 2017). However, due to the size of these content clusters and the physical building space of high schools, teachers and staff may only interact and/or collaborate with a small portion of their colleagues each day (Flannery et al., 2018). As a result of this limited interaction, high school departments or content area teams commonly form their own culture and their own method to teaching and managing behavior (Flannery et al., 2013, 2018). Although this approach may have many benefits, it can also result in lower schoolwide implementation fidelity

efforts (Flannery et al., 2018). To ensure the consistent use of practices, it is important for high schools to address these differences prior to implementing schoolwide efforts and when seeking initial staff investment and gathering feedback on the progression of implementation efforts (Flannery et al., 2013, 2018).

Furthermore, high schools tend to have more staff and students than elementary and middle schools. This increase in number presents a barrier in creating and maintaining predictability and consistency when implementing any schoolwide initiative (Flannery et al., 2018). It can be challenging for teachers who are responsible for providing instruction across multiple subjects and with different groups of students to deliberately ensure students receive exposure to a consistent set of expectations, opportunities for positive acknowledgement and reinforcement, and consequences for inappropriate behaviors each day (Flannery et al., 2013). Thus, school size alone presents the need for high schools to communicate with more people and on a more frequent basis to ensure common language and understanding throughout each stage of implementation (Flannery & Kato, 2017; Flannery et al., 2018).

Finally, high schools generally have multiple feeder schools, which produces a more diverse student population and encourages the re-formation of many existing peer networks and support systems (Flannery & Kato, 2017). Having a more diverse student population at this level means students may have a broader range of needs, which can directly affect the number and types of support services made available to students (Flannery & Kato, 2017). Based on the increased student population, high schools may also experience a rise in student conflicts as differing values and cultural norms are merging within a new, more diverse environment (Flannery et al., 2013, 2018). If not intentionally planned for and coordinated, size-related

variables such as these can negatively affect communication, data collection, and implementation of identified EBPs (Flannery et al., 2018).

       Student Developmental Level. The second contextual variable is the developmental level of students at the high school level. High school students differ fundamentally from elementary and middle school students and it is important for teams to appropriately adapt their implementation of the SWPBIS framework (Flannery et al., 2013). As students progress in age, they have a greater desire to be more autonomous, place an increased emphasis on being actively involved in decision-making, and tend to prioritize peer interactions over academics (Flannery et al., 2013, 2018; Flannery & Kato, 2017). As a result of these differences, teachers in high schools are encouraged to provide a variety of ways students can be actively involved in the planning, development, and implementation of practices (e.g., behavioral expectations, systems to acknowledge positive behavior; consequences) and systems (e.g., teaming structures, training, communication) associated with SWPBIS in their schools (Flannery et al., 2018).

       When considering the age of students in high school, a common misconception made by staff is the assumption of students' knowledge and understanding of expectations and rules, and their need for a continuum of support (Flannery et al., 2013, 2018). Given that high school students are more developmentally advanced, high school faculty commonly believe students should have acquired appropriate social behavior and self-management prior to transitioning to high school and, therefore, it is unnecessary to teach and reinforce appropriate behavior (Flannery et al., 2013). Due to these prevalent presumptions, the implementation of SWPBIS in high school settings should involve unique considerations to ensure faculty investment in the implementation of universal practices that pertain to the continuous teaching of expectations,

acknowledging and reinforcing positive student behavior, and ensuring consistent administration of consequences (Flannery & Kato, 2017; Flannery et al., 2013, 2018).

  Organizational Culture Prioritizing Academic Growth. The third contextual variable that influences high school SWPBIS implementation is the school's organizational culture (Flannery et al., 2013, 2018; Flannery & Kato, 2017). Flannery et al. (2018) defined organizational culture as the expectations, values, beliefs, and attitudes that are held by the stakeholders within an organization. High school organizational cultures strongly influence the behaviors of adults and students in each school building, the prioritization of systems-based initiatives, the use of data-collection systems for instructional decision making, and the emphasis on team collaboration (Flannery et al., 2018). Common values or attitudes amongst most high schools include a transition away from a social-emotional focus to one that is purely academic and an increase in the use of exclusionary discipline approaches (Flannery et al., 2018). Even though all grade levels focus on increasing student achievement through academic instruction, teachers at the high school level often place a stronger emphasis on their specific content area (e.g. English, biology) and are less likely to perceive it to be their responsibility to teach non-academic content such as study strategies or social skills (Flannery & Kato, 2017; Flannery et al., 2018). In addition, given that high schools generally have multiple placement options for instruction (e.g., varying levels of English, alternative schools, college preparation courses), there is a common "push out" mentality among high school educators that there is always another instructional setting if a student is not experiencing success (Flannery & Kato, 2017; Flannery et al., 2018).

  In sum, high schools have three unique contextual characteristics, including school size, student developmental level, and an organizational culture that prioritizes academic growth,

making SWPBIS implementation more challenging in high schools than in elementary or middle schools. If not deliberately considered when implementing SWPBIS at the high school level, these contextual factors may influence key foundational systems associated with leadership, communication, and data (Flannery & Kato, 2017).

SWPBIS Research at the High School Level

A growing research base continues to emerge documenting feasibility of SWPBIS at the high school level and positive outcomes associated with academic and behavioral outcomes for high schools implementing SWPBIS with fidelity. Flannery et al. (2013) examined the feasibility and fidelity of SWPBIS implementation across eight diverse public high school settings in two states. The authors used the School-Wide Evaluation Tool (SET) to measure the implementation of universal systems and practices and found that with support, high school teams were able to demonstrate positive changes in their implementation levels of SWPBIS components; however, statistically significant changes did not occur until schools had been implementing for at least 2 year. Additionally, results from this study suggest that although high schools were able to implement universal components of SWPBIS with fidelity, implementation efforts may take longer at the secondary level. As a result of this finding, Flannery et al. suggested high schools should intentionally focus on specific areas (i.e., establishing systems regarding communication, consensus building, schoolwide collaboration) when beginning implementation.

Similarly, Bradshaw et al. (2015) investigated the adoption and implementation of SWPBIS in 31 high schools randomly assigned to implement SWPBIS within the context of a larger 58 high school randomized trial over 2 years. The authors used a group randomized controlled design to evaluate the implementation of SWPBIS in high schools and its effects on the levels of bullying and other indicators of school disorder (e.g., student-teacher ratio,

suspensions, certified teachers, mobility rates). Results indicated schools generally made greater gains in fidelity when implementing universal features of SWPBIS as compared to additional layers of support. Furthermore, multilevel analyses on the longitudinal implementation data indicated schools with higher baseline rates of bullying often implemented SWPBIS with greater implementation fidelity over time; however, other baseline indicators of school disorder did not appear to be associated with the level of SWPBIS implementation and did not present barriers to schools' adoption efforts.

In addition to evaluating feasibility and implementation fidelity, researchers also have investigated the effectiveness of SWPBIS on reduction in student behavior and disciplinary referrals in association with level of implementation fidelity. For example, Freeman et al. (2019) examined the relations between SWPBIS implementation fidelity and student-level behavior (i.e., ODRs, suspension), attendance (i.e., tardies, days absent), and academic (GPA) outcomes across 15 high schools under typical implementation conditions. Based on a review of multiple sources of data (i.e., attendance, academics, behavior), results suggested the high schools implementing SWPBIS with fidelity were likely to see improvements in student outcomes beyond that of reductions in ODRs. Additionally, schools implementing SWPBIS with fidelity experienced fewer unexcused tardies, absences, ODRs, suspensions.

Further, Bohanon et al. (2006) conducted a 3-year evaluation study that investigated ways in which traditional SWPBIS would need to be adapted when applied to an urban high school setting and the effects of SWPBIS on schoolwide discipline outcomes. Bohanon et al. used a mixed-methods approach and found that the overall implementation fidelity rating was 80% on critical components of universal prevention according to SET and an overall reduction of 20% in the number of ODRs during years in which SWPBIS was implemented.

Additionally, Flannery et al. (2014) examined the effects of SWPBIS on the levels of individual student problem behaviors in 12 high schools (eight implementing SWPBIS, four served as comparison schools). During a 3-year effectiveness trial without random assignment to condition, results of a multilevel latent growth model indicated statistically significant decreases in student ODRs in schools implementing SWPBIS and steady increases in comparison schools over the course of the study. Follow-up analyses also noted a statistically significant inverse relation between fidelity of implementation and student behavior. These analyses not only confirmed that SWPBIS significantly reduced problem behavior for students in high schools, but also showed that the degree of reduction was significantly related to the level to which critical features of universal practices within SWPBIS were implemented with fidelity.

Researchers also have investigated the effects of SWPBIS on dropout rates. Freeman et al. (2015) explored the direct and indirect effects of SWPBIS on high school dropout rates from a large sample of high schools in 37 states. Using a structural equation modeling method to analyze the relationships between important high school level outcomes and SWPBIS, the authors found that SWPBIS had a statistically significant positive effect on attendance and that attendance was a proximal and statistically significant indicator of high school dropout risk. Additionally, schools with higher rates of sustained implementation fidelity experienced marginally statistically significant declines associated with their rate of events of dropout. Although this study did not specifically examine the association of SWPBIS with dropout rates, Freeman et al. indicated SWPBIS may increase a school's capacity to address varying student needs through the use of a continuum of supports, and encouraged that further research should be conducted that conceptualizes and examines dropout events as a systems level failure in need of a systematic tiered intervention.

In conclusion, an expanding research base continues to develop documenting the practicality of SWPBIS at the high school level and positive academic and behavioral outcomes for high schools implementing SWPBIS with fidelity. For high schools implementing SWPBIS with fidelity, research has documented outcomes associated with the feasibility of implementation, decreases in student tardies and absences, and reductions in student behavior and the use of exclusionary disciplinary actions (i.e., OSS, suspensions). Moreover, SWPBIS may be indirectly related to academic achievement as a result of improved attendance and behavioral outcomes. Additional research is needed to examine the use and implementation of evidence-based classroom management practices within a SWPBIS framework that promotes increased opportunities for high school student engagement in the learning process.

Summary

High school is a critical period in a student's educational careers; however, it also can be an occasion when many youth experience academic, behavioral, and social-emotional challenges (Flannery et al., 2014). As a result of these challenges, a concerning rate of students are dropping out of high school. Researchers have suggested dropout prevention efforts focus on the use of a proactive, systematic, multitiered systems of support framework as an effective way to reduce student dropout rates (Freeman et al., 2015; Lee & Burkam, 2003; Lehr et al., 2003; Mac Iver, 2011). One such framework is SWPBIS, which is a multitiered, prevention-oriented, problem-solving approach that has been associated with direct reductions in numerous behaviors related to dropout risk factors such as improvements in attendance (e.g., Caldarella et al., 2011; Freeman et al., 2019; Horner et al., 2009), academic outcomes (e.g., Freeman et al., 2019; Madigan et al., 2016; Muscott et al., 2008), and school climate (e.g., Bohanon et al., 2009; Bradshaw et al., 2015), as well as reductions in disciplinary rules violations (Bohanon et al., 2006, 2012; Flannery

et al., 2013; Freeman et al., 2015, 2016, 2019; Muscott et al., 2008). Various literature reviews and meta-analyses also have established the evidence base of SWPBIS (Chitiyo et al., 2012; Horner et al., 2010; Noltemeyer et al., 2019; Solomon et al., 2012). Despite the effectiveness of SWPBIS, the majority of empirical research has focused on elementary and middle schools with relatively limited evidence base at the high school level. High schools are faced with three unique contextual characteristics, including school size, student developmental level, and an organizational culture that prioritizes academic growth, making SWPBIS implementation more challenging at this level when compared to elementary or middle schools. However, existing research addressing SWPBIS implementation at the high school has shown feasibility and effectiveness in producing positive academic and behavioral outcomes when implemented with fidelity (Bohanon et al., 2006: Bradshaw et al., 2015; Flannery et al., 2013, 2014; Freeman et al., 2015, 2019).

Evidence-based Classroom Management Practices

The use of EBPs is an essential feature of universal instruction within a SWPBIS framework to address the needs of all students across all academic settings. EBPs are instructional strategies that have acquired substantial empirical support and have been shown to produce socially significant student outcomes (Cook & Cook, 2011). Additionally, EBPs are exclusively different when compared to other research-based practices in that a depth and breadth of reliable research, that meets specific standards of rigor, must be used to support the outcomes these practices claim to produce (Cook & Cook, 2011). However, a significant and persistent research-to-practice gap exists in education (Carnine, 1997; Cook & Schrimer, 2006; Cook & Cook, 2011). Specifically, educators have commonly determined what they perceive to work best in the classroom by selecting instructional practices that have been identified from

sources such as tradition, personal experience, and expert opinion (Cook & Cook, 2013). Even though these sources have provided researchers with insights into effective practices, they are generally misleading to educators and prone to creating assumptions that ineffective practices are effective (i.e., Type I error) and that effective practices are in fact ineffective (i.e., Type II error), which has contributed to the research-to-practice gap in education (Cook & Cook, 2013). Based on the intensive research-based examination of EBPs, researchers have found that EBPs have significant potential to aid in bridging the research-to-practice gap and positively affecting meaningful change in educational outcomes for students, especially those who are at risk for school failure and who may require additional layers of instructional support (Cook & Cook, 2011).

Evidence-based Practices in Education

The use of EBPs began in the field of medicine but was quickly adopted by other disciplines, including education (Russo-Campisi, 2017). Educational practitioners identified and implemented EBPs to ensure that students are receiving instructional practices that have demonstrated to be effective through research and will result in overall improved academic and behavioral outcomes for students (Cook & Cook, 2013; Russo-Campisi, 2017). In addition to targeting positive student outcomes, the use of EBPs in education has been intended to enhance the level of accountability of educators by promoting the use of instructional practices that are empirically based (Russo-Campisi, 2017). Over time, federal mandates such as No Child Left Behind (NCLB; 2002) and IDEA (2004) have emphasized the use of effective practices based on scientifically based research. Even though both legislations recognize the role of research in selecting effective educational practices, neither explicitly mandates practitioners use evidence-based practices as defined by evidence-based reviews (Russo-Campisi, 2017). More recently in

2015, the Every Student Succeeds Act (ESSA) replaced the former NCLB and required schools

identified as low-performing to use federal monetary subsidy to fund the implementation of

interventions that meet specific standards outlined in the law. In this legislative mandate, an

intervention was deemed promising based on the empirical findings of at least one highly

qualified, correlational study (Russo-Campisi, 2017). Even though this federal policy included

the use of EBPs within the language, individual states were ultimately provided with the ability

to make their own selection of instructional practices. Allowing this individual selection process

created misinterpretations and misconceptions of EBPs within academic discourse and across

educational settings, while also contributing to barriers associated with the implementation of

EBPs (Russo-Campisi, 2017).

As with any other social science, education comprises specific, discipline-related, and

universally defined terminologies that are commonly communicated among researchers and

practitioners (Russo-Campisi, 2017). A general assumption in education is that all instructional

practices that have been proven to be effective in producing positive student outcomes are

considered EBPs; however, there are substantial differences between the terminologies that are

used to describe these practices in evidence-based reviews when compared to other forms of

research dissemination (Cook & Cook, 2011; Russo-Campisi, 2017). The term "EBP" is often

used by educators, researchers, and policy makers interchangeably with terms such as

scientifically based research (SBR) and peer-reviewed research (PRP; Cook & Cook, 2011;

Russo-Campisi, 2017; Zirkel, 2008) when discussing empirically validated practices in addition

to practices that are being encouraged in the absence of substantial supporting research.

Although these terms may seem synonymous, there is a considerable difference in their meaning

and the bodies of research that describes them (Russo-Campisi, 2017).

Within education, and across related disciplines, there are a number of organizations and proposed techniques for identifying EBPs, each with a preferred list of qualifications that must be included when considering a practice to be evidence based (Cook & Cook, 2011). Despite possible differences, there are four common fundamental elements across approaches: research design, quantity of research, quality of research, and magnitude of effect related to supporting empirical evidence (Cook & Cook, 2011).

Research Design

Although a vast array of research designs have been used to aid in informing and improving academic, behavioral, and social-emotional outcomes for students (Cook & Cook, 2011, 2013; Odom et al., 2005), research consumers may only consider causality from studies that (a) use either single-case research (e.g., multiple baseline, reversal, alternating treatments, changing criterion) or group comparison experimental designs (e.g., randomized experiments, regression discontinuity design, non-randomized quasi-experiments) and (b) are considered to be methodically sound (CEC EBP Workgroup, 2014).

Specific to the field of education, Gersten et al. (2005) and Horner et al. (2005) recommended that when determining if a practice has the best available evidence, researchers and consumers should only examine studies using group experimental, group quasi-experimental, and single-case research as these designs specifically address whether the independent variable (e.g., an instructional practice) causes change in the dependent variable(s) (e.g., student outcomes; Cook & Cook, 2011; Cook et al., 2008). Furthermore, these research approaches are designed to exclude primary alternative explanations related to changes in student outcomes outside of the practice being examined (Cook & Cook, 2011). More recently, the CEC (2014) and WWC (2020) have expanded on the work of Gersten et al. and Horner et al. by

establishing detailed descriptions of procedures and standards that should be used when reviewing studies. Although there are slight differences in the procedures and standards, both organizations confirm the use of experimental research designs that can be used to infer causality and that studies should be methodologically sound in order to ensure that high quality and trustworthy studies are being considered when determining EBPs (Carnine, 1997; CEC EBP Workgroup, 2014).

Quantity of Research

Empirical research by nature is ever evolving. Researchers gain confidence in empirical findings as studies and outcomes are replicated over time (Cook & Cook, 2011). Therefore, the identification of EBPs is not solely based on the outcomes from a singular study, but rather an accumulation of methodologically sound studies with appropriate designs that reliably demonstrate socially significant improvements in student outcomes (Carnine, 1997; Cook et al., 2015; Cook & Cook, 2011, 2013). When examining the use of group experimental and quasi-experimental studies, Gersten et al. (2005) specified that at least two studies with these research designs should be used when considering a practice as evidence based. Furthermore, Horner et al. (2005) recommended the use of a minimum of five high quality single-case research studies that (a) were published in peer-review journals, (b) were conducted in at least three different geographical locations, (c) were conducted by at least three different research groups with no overlapping authorship, and (d) included a minimum of 20 participants across studies for the practice to be considered evidence based.

In addition to requirements pertaining to the number of studies that have demonstrated positive student outcomes, some methods for identifying EBPs also specify a maximum number of studies demonstrating negative or indeterminate effects (Cook & Cook, 2011). For example,

WWC (2020) requires practices demonstrating positive effects (their highest rating category) to (a) be supported by at least two acceptable studies, one of which is obligated to be a randomized controlled trial, and (b) not have any demonstration of negative effects shown in acceptable studies (Cook & Cook., 2013). Having a sufficient evidence base is imperative when determining EBPs, but it is also equally important that studies being conducted are of high quality.

Quality of Research

At its most foundational level, educational research should be conducted to provide vital resources to teachers related to effective systems, data, and instructional practices that can be used to produce socially significant outcomes for students and staff; however, teachers often have concerns regarding the quality of educational research findings (Carnine, 1997). Carnine (1997) suggested the quality of educational research should be evaluated based on its level of trustworthiness, usability, and accessibility. Carnine referred to trustworthiness as the confidence practitioners could have in research findings, usability as the practicality of the instructional practice for those attempting to implement it, and accessibility as a measure of the extent to which findings are available to inservice practitioners. Carnine further emphasized the need for research organizations to adequately disseminate additional information to practitioners pertaining to validated educational practices. The call for researchers to present findings to consumers that can be evaluated with confidence, used easily by those conducting the implementation, and made readily available to both preservice and inservice educators, has encouraged researchers within the field of education to establish methods to address a number of methodological shortcomings (Cook & Cook, 2011).

A trademark of EBPs is that they have met a requirement of prescribed standards (i.e., quality indicators) that have been confirmed by a number of empirically based research studies.

Gersten et al. (2005) recommended that, in order to be considered as high and acceptable quality, group experimental and group quasi-experimental studies are required to meet nine of 10 proposed essential quality indicators (Cook & Cook, 2011; Cook et al., 2013). Gersten et al. also made a recommendation stating that high quality group studies must also address at least four out of eight specific desirable quality indicators, whereas acceptable quality studies need to meet at least one of the desirable quality indicators. Furthermore, Horner et al. (2005) suggested that practices examined using single-case research must meet all 21 recommended quality indicators.

Expanding on the work previously established by Gersten et al (2005) and Horner et al. (2005), CEC's EBP Workgroup (2014) identified eight quality indicators and 26 sub-indicators for determining the methodological rigor of studies and categorization of EBPs. Based on the recommendations made by the Workgroup, studies are determined to be methodologically sound if all of the quality indicators relevant to the design of the studies have been met. In addition to the CEC EBP Workgroup recommendations (2014), WWC (2020) also established a systematic review process for examining educational research according to a set of specific standards as they apply to acceptable research designs. According to the identified standards, the quality of instructional practices may be considered as eligible to meet WWC standards without reservation, with reservation, or designated as having not met standards.

Magnitude of Effect

In addition to being considered high quality, studies examined for the purpose of identifying EBPs must also demonstrate valid effects on student outcomes. Theoretically, to be considered an EBP, research should have demonstrated positive, robust, and socially valid effects on academic, behavior, and/or social-emotional outcomes for students. Conversely, studies demonstrating inconsequential effects related to pedagogical or function are deemed to be

insignificant (Cook & Cook, 2011). In order for a practice to be considered as having a sufficient evidence base, recommendations from Gersten et al. (2005) called for high and adequate quality studies examining the practice to have demonstrated a weighted effect size significantly greater than zero. Comparatively, WWC (2020) requires the examination of effect sizes at the level of individual group experimental and quasi-experimental studies when determining EBPs. When determining if a practice has demonstrated sufficient positive effects, group experimental studies are only considered by WWC if they have indicated statistically significant results. Alternatively, WWC categorizes studies that have shown results that were either statistically significant or substantively important as demonstrating potentially positive effects (Cook et al., 2015). For single-case research, Horner et al. (2005) recommended that all single-case research studies that are deemed to be high quality must have demonstrated a socially significant change in student outcomes.

In sum, to be considered highly effective, empirical methods of research should be used to rigorously examine and evaluate educational practices (Gersten et al., 2005; Horner et al., 2005). Once identified, EBPs can be implemented by practitioners across instructional levels and settings to help improve academic and behavioral outcomes for students and to reduce the research-to-practice gap (Cook & Cook., 2013).

EBPs in Classroom Management

Identification of EBPs applies to classroom management practices for educators to increase academic engagement and minimize disruptive student behavior in the classroom (MacSuga & Simonsen, 2011; Simonsen et al., 2008). Highly effective classroom instruction is dependent upon a strong classroom management foundation that encourages and maintains appropriate student behavior, increases academic engagement, and subsequently, academic

achievement (Gage et al., 2017; Stronge et al., 2011). Traditionally, schools have relied on reactive policies to manage student behavior instead of using a proactive and comprehensive teaching model that supports students in developing appropriate prosocial behaviors (Menzies et al., 2017). Regrettably, several studies measuring the influence of teacher behavior and classroom context on the behavioral and academic outcomes for students found that students identified as demonstrating challenging behaviors received less instruction, fewer instances of teacher praise, and fewer OTR (Simonsen et al., 2014; Sutherland et al., 2008; Sutherland & Oswald, 2005). These students receive more reprimands, are more likely to experience exclusionary discipline practices that increase in frequency and intensity over time, and experience fewer satisfying relationships with peers and teachers (Menzies et al., 2017; Mitchell & Bradshaw, 2013; Simonsen et al., 2014). Teachers who are able to effectively manage their classrooms are able to maximize student engagement and increase the likelihood of academic success (Simonsen et al., 2014). Therefore, as an essential component of effective teaching, EBPs in classroom and behavior management are critical for all teachers and students (Simonsen et al., 2010).

According to Egeberg et al. (2016), EBPs in classroom management consists of three fundamental elements, including proactive behavior management practices, maximized allocation of time for instruction, and arrangement of instructional activities to maximize academic engagement and achievement. EBPs in classroom management are used to establish positive learning environments through the implementation of preventative, rather than reactive, instructional approaches (Egeberg et al., 2016). Several studies exist that identify evidence-based classroom management practices. Simonsen et al. (2008) conducted a comprehensive literature review to investigate documented EBPs in classroom management. To identify potential topics,

the authors reviewed 10 classroom management texts, which were used to create a list of recommended practices. Based on the established list, authors constructed five groups of practices: (a) physical arrangement of class, (b) structure of classroom environment, (c) instructional management, (d) procedures designed to increase appropriate behavior, and (e) procedures designed to decrease inappropriate behavior. Authors then examined the empirical literature related to each topic to identify specific practices that met their selected criteria for being EBPs. For the purposes of this review, Simonsen et al. considered classroom management practices to be evidence based if they were (a) evaluated using sound experimental design and methodology, (b) demonstrated findings associated with positive, socially valid student outcomes, and (c) validated by at least three empirical studies published in peer-reviewed journals. Results of the literature search yielded 20 general practices that met the criteria for being evidence based and these practices fell into one of the five categories as essential features of effective classroom management: (a) maximize structure (e.g., amount of adult directed activity, extent to which routines are explicitly defined, physical arrangement of the classroom); (b) post, teach, review, monitor, and reinforce expectations (e.g., post a small number of positively stated previously identified expectations in the classroom, explicit teaching and frequent reviews expectations, instruction paired with feedback and reinforcement, active supervision); (c) actively engage students in observable ways (e.g., increasing OTRs, direct instruction, classwide peer tutoring, guided notes) ; (d) use a continuum of strategies for responding to desired behaviors (e.g., specific, contingent praise, group reinforcement contingencies, behavior contracts, token economies); and (e) use a continuum of strategies for responding to undesirable behaviors (e.g., brief, contingent, and specific error correction,

performance feedback, differential reinforcement, planned ignoring, response cost, time-out from reinforcement).

Similarly, Conroy et al. (2013) synthesized findings from six literature reviews to establish an extensive collection of empirically supported EBPs in classroom management that have been shown to reduce undesirable classroom behaviors and increase student engagement. Based on the 36 practices that were identified, Conroy et al. constructed four broad categories: (a) antecedent-prevention, including classroom structure and expectations; (b) instruction and interaction, specific to delivery of OTRs and active supervision; (c) consequence-based, such as group contingencies and behavior contracts; and (d) self-management strategies, including self-monitoring and self-reinforcement. Results from this research demonstrated there are specific EBPs in classroom management that increase the probability of student academic engagement and decrease the chances students engage in disruptive behaviors.

Furthermore, Lewis et al. (2004) conducted a literature review to identify empirically supported classroom management practices that supported students with or at risk for emotional and behavioral disorders (EBD). Findings from this study produced four strategies supported by scientifically-based research to improve outcomes for all students, and more specifically students with or at risk for EBD: (a) teacher praise, (b) high rates of OTRs during instruction, (c) clear instructional strategies (i.e., direct instruction), and (d) positive behavior interventions and supports. While the authors were able to identify four validated instructional practices, they acknowledged the discrepancy between the implementation of these practices across educational settings and within classrooms remains considerable (Lewis et al., 2004; Singer, 2000; Willis et al., 2018).

In addition to the identification of evidence-based classroom management practices, researchers have specifically examined the effectiveness of EBPs in classroom management. In an earlier meta-analysis, Marzano et al. (2003) examined the overall effectiveness of EBPs according to four management factors associated with effective classroom management (i.e., rules and procedures, disciplinary interventions, teacher-student relationships, and mental set). Of the 87 studies reviewed, findings from this analysis demonstrated an average effect size of .90 ($p < .05$) for producing reductions in events of student problem behaviors within instructional settings when compared to control classrooms. Marzano et al. also evaluated the effects of EBPs in classroom management on student achievement and engagement across 12 studies, identifying a statistically significant and positive effect size of .52 ($p < .05$) on academic performance and .61 (($p < .05$) on academic engagement. Furthermore, Oliver et al. (2011) conducted a meta-analysis on EBPs in classroom management that identified 12 experimental or quasi-experimental studies with control groups for inclusion. Results from this study indicated the use of EBPs in classroom management had a main effect size of .80 ($p < .05$) on problem behaviors (e.g., aggression, off-task, disruptive behaviors). Collectively, these studies provide evidence to support the use of effective EBPs in classroom management as efficient approaches for improving and addressing academic engagement and student behavior in instructional settings.

Preservice and Inservice Preparation of EBPs in Classroom Management

Even though instruction in identifying and delivering EBPs in classroom management has been identified as a critical component of preservice preparation programs (Auld et al., 2010; Ficarra & Quinn, 2014; Kennedy & Thomas, 2012), preservice teachers continue to receive insufficient amount of instruction in these areas (Ficarra & Quinn, 2014; Levine, 2006; Oliver & Reschley, 2007, 2010). Furthermore, based on a sampling across all instructional levels, only

18% of practitioners reported having learned skills pertaining to EBPs in classroom management during their teacher preparation programs (Ficarra & Quinn, 2014; Merrett & Wheldall, 1993), indicating formal, higher education coursework sequences may not be a common source for acquiring knowledge and skills needed to identify and implement evidence-based classroom management practices with fidelity (Ficarra & Quinn, 2014; Smart & Igo, 2010). In addition to receiving limited coursework related to EBPs in classroom management, preservice teachers are typically presented with insufficient opportunities in demonstrating practices during field placement assignments that present chances for direct instruction, coaching, and feedback (Capizzi et al., 2010; Ficarra & Quinn, 2014; Moore-Partin et al., 2010; Oliver et al., 2011; Simonsen et al., 2010, 2012). More specifically, researchers have indicated that preservice general education majors have reported little to no preparation in the selection and implementation of evidence-based classroom management practices (Brownell et al., 1997; Ficarra & Quinn, 2014; Kennedy & Thomas, 2012; Tillery et al., 2010). Further, Reupert and Woodcock (2010) noted the strategies practitioners select to use are generally influenced by their perceived understanding and ability to confidently implement them, even if other strategies have been shown to be more effective.

Being able to identify EBPs in classroom management and having a general understanding of how to implement them in instructional environments are important skills for practitioners to acquire in today's educational settings (Baker, 2005; Ross & Sliger, 2015). Over the past 30 years, teachers have persistently identified and requested the delivery of EBPs in classroom management as an area for which additional professional development (PD) is needed to establish and further develop knowledge and skills that were not sufficiently acquired during preservice educational programs (Baker, 2005; Lewis, 1999; Maag, 2001; Ross & Sliger, 2015;

Stormont et al., 2011; Tillery et al., 2010). Research has demonstrated that practitioners who possessed greater skills in delivering and implementing EBPs in classroom management were more likely to effectively use proactive, preventative instructional approaches to positively managing student behavior (Simonsen et al., 2008). Based on the limited preparation and training most practitioners receive on EBPs in classroom management to meet the needs of diverse learners (Birman et al., 2000; Freeman et al., 2014; Mitchell et al., 2017; Oliver & Reschly, 2010), there is a vital need for preservice and inservice practitioners to receive more explicit instruction in implementing effective, efficient, and sustainable EBPs specific to classroom management.

Opportunities to Respond

Increasing opportunities to respond (OTRs) has been identified as one EBP in classroom management (Haydon et al., 2010; Simonsen et al., 2008, 2014; Sutherland et al., 2003). As reported by Greenwood et al. (1984), an OTR is "the interaction between (a) teacher formulated instruction (e.g., teacher prompt is given, question is asked, signal is provided to encourage response) and (b) its success in establishing the academic responding desired or implied by materials, the subject matter goals of instruction" (p. 64). OTRs can be presented to students in a number of ways, such as (a) by the teacher during direct instruction (e.g., choral responding), (b) through the use of technology (e.g., gaming), or (c) when students collaborate with peers (e.g., peer-tutoring; Common et al., 2020; MacSuga-Gage & Simonsen., 2015). During direct instruction, the teacher is able to present an OTR to one or more students, the student(s) are given a chance to respond, and then the teacher provides the student(s) with feedback contingent on the response student(s) produced (MacSuga-Gage & Simonsen., 2015). When a teacher presents a student with an individual response, Lambert et al. (2006) defined this as "calling on

only one student to answer the question while the rest of the class sits quality and listens" (p. 89).

On the contrary, a unison response is when a teacher presents an OTR to an entire group of

students and asks students to respond collectively through either verbal communication (e.g.,

choral responding) or nonverbal communication (e.g., written responses, such as response cards;

gestural response, such as thumbs up/down or hand raising; Carnine, 1976; Haydon et al., 2010;

Haydon & Hunter, 2011; Lambert et al., 2006; MacSuga-Gage & Simonsen., 2015).

When presenting OTRs, teachers ideally want to provide students with multiple and

varied OTRs at a brisk pace while delivering direct instruction, but not at such a rapid pace that

students are not provided with adequate wait time and are unable to participate (Common et al.,

2020; Sutherland & Wehby, 2001). By providing an increased rate of OTRs, teachers can help

advance students' fluency and automaticity in basic skills across instructional content areas and

use OTRs as a formative assessment to gage students' proficiency with material (Common et al.,

2020; Lane et al., 2015). According to CEC (1987), the optimal teacher-delivery rate for OTRs is

(a) four to six times per minute for new material, with 80% accuracy in student response, and (b)

eight to 12 times per minute when reviewing material, with 90% accuracy in student response.

Presenting students with increased rates of OTRs allows teachers to adjust their own

teaching behavior while delivering instruction to directly improve student outcomes (MacSuga-

Gage et al., 2015). Providing an adequate rate of OTRs is a teacher-centered, instructional

classroom management practice that has demonstrated empirical evidence supporting its

effectiveness in increasing academic engagement for students with and without disabilities

(Carnine, 1976; Christle & Schuster, 2003; Davis & O'Neil, 2004; Haydon et al., 2010, 2012,

2009; MacSuga-Gage & Simonsen, 2015; Sutherland et al., 2003; Whitney et al., 2015) and

decreasing disruptive classroom behavior (Armendariz & Umbreit, 1999; Haydon et al., 2009,

2010; Lambert et al., 2006; MacSuga-Gage & Simonsen, 2015; Sutherland et al., 2003; West & Sloan, 1986; Whitney et al., 2015). Given the benefits associated with elevated rates of OTRs, it is imperative that teachers develop the skills needed to increase their delivery of OTRs during direct instruction (Whitney et al., 2015).

Origin of OTR

While conducting studies focusing on how reinforcement and other consequences could be manipulated to improve student performance, Vance Hall and his colleagues at Juniper Gardens Children's Project first brought attention to the importance of active student participation during instruction, a variable they referred to as OTRs (Delquadri et al., 1979; Gardner et al., 1994; Hall et al., 1977, 1982). Targeting the development of instructional procedures that prompted increased frequency and diverse methods of response for students during direct instruction, research staff at Juniper Gardens found that elevated rates of OTRs enhanced student engagement from five to 20 times that of traditional instructional methods (Greenwood et al., 1984; Hall et al., 1989).

Beginning in 1977, research at the Juniper Gardens Children's Project set forth to improve outcomes for students at risk and students with disabilities by examining interactions between students and their educational learning environments (i.e., eco-behavioral interactions). During initial examinations of school environments, researchers at the Juniper Gardens Children's Project reported that students were spending minimal amounts of time engaging in direct instruction (Hall et al., 1977, 1982). For example, when directly observing 12 students in grades 1-4 across six inner-city classrooms, Hall et al. (1982) noted that while 75% of students' school day was dedicated to instruction in academic subjects, only 25% of the day was spent in active academic responding. Furthermore, students spent as much as 45% of the instructional day

passively attending to the teacher during the delivery of instruction. Findings from this study suggested that students who were in need of increased opportunities to engage in academic behavior, practice content related skills, and receive specific, contingent feedback were rarely provided with the opportunity to do so. Following this study, researchers noted that explanations for the learning failures students experience are often mistakenly attributed to variables that characterize the student rather than the inadequacies of the instructional environment and limited learning opportunities presented to the students. Thus, one of the major outcomes associated with the study of eco-behavioral interactions at Juniper Gardens was the identification of OTRs as an essential component of effective instruction.

Evidence Supporting the Implementation of OTR

Since the initial exploration of student engagement at the Juniper Gardens Children's Project, the concept and use of OTRs have been adopted within the field of education and widely examined by a number of researchers. As a result of this research, several reviews exist that have provided evidence supporting the effectiveness of increased OTRs. In a systematic review of empirical literature examining the relationship between increased rates of OTRs and the academic and behavioral outcomes of students with EBD, Sutherland and Wehby (2001) identified six studies that met inclusion criteria (i.e., participating students were identified with EBD, the study implemented OTRs and measured either academic or behavioral changes, the study was published in a peer-reviewed journal) between 1966 and 2001. Results from this research indicated that increased rates of OTRs had positive effects on academic and behavioral outcomes of students with EBD, including increased efficiency in the use of class time and student engagement, as well as decreases in disruptive behavior. Although the research by Sutherland and Wehby brought attention to the effects of increased OTRs, their review focused

only on students with EBD and did not include an explicit description of the impact each type of response (e.g., choral responding, response chards, individual responding) had on student outcomes.

Twelve years later, Haydon et al. (2013) conducted a literature review to examine and compare the effects of choral and individual OTRs on student outcomes for students with disabilities across age spans and grade levels. Authors reviewed six single-case design studies based on the following inclusion criteria: (a) at least one student participant was identified as having a disability, (b) at least one of the purposes of the study was to compare choral and individual student response, and (c) the study used either a single-case or group design. Results showed choral responding was associated with differential increase in active student response and on-task behavior during direct instruction; however, these effects did not appear as strong when delivered in small group instructional environments. Furthermore, differential academic gains were not found to be present when comparing the use of choral and individual responding across instructional settings (i.e., class contexts). The review conducted by Haydon et al. expanded on the work of Sutherland and Wehby (2001) by broadening the scope of participations, yet the sample still exclusively included students with disabilities.

In another study, MacSuga-Gage and Simonsen (2015) systematically reviewed empirical literature to investigate the effects of OTRs on student academic and behavioral outcomes, including differential effects by modality. Using a multiphase review procedure to examine the literature base, authors identified and reviewed 527 abstracts. Of the 527 abstracts that were reviewed, 15 studies published from 1968 to 2012 met all inclusion criteria (i.e., focused on the use of classwide OTRs, included students with and without disabilities). Results indicated that when compared to individual teacher-directed OTRs, providing students with teacher-directed

OTRs that focused on unison responses resulted in increased positive academic and behavioral outcomes for all students. Furthermore, MacSuga-Gage and Simonsen noted that all studies that examined the effects of increasing rates of OTRs during teacher-directed instruction demonstrated positive outcomes for student with and without disabilities, including: (a) increases in correct responses, student engagement, and on-task behavior; and (b) decreases in off-task and disruptive behaviors.

Building on the foundation of previous reviews, Fitzgerald Leahy et al. (2018) conducted a quantitative synthesis of single-case design research to investigate the effects of increased rates of OTRs on student behavioral outcomes, while also specifically examining student response mode, grade level, and singe-case design research quality ratings. Using a multiphasic review process to systematically search and review literature found in educational databases, 12 studies (including 78 student participants and ranging in publication dates from 1976 to 2015) were reviewed. Results indicated that high rates of OTRs were associated with improved student outcomes across unison and mixed response modalities and grade levels. Even though a comparison of the effects of OTRs at varying instructional levels indicated improved student outcomes, results showed that elementary grades were consistently associated with greater than average effects on student behavioral outcomes.

Most recently, Common et al. (2020) systematically reviewed empirical literature to determine the evidence-based status of teacher-directed OTRs during whole-group instruction across all grade levels. More specifically, this review was conducted to determine the extent to which OTRs could be classified as an EBP according to CEC's *Standards for EBPs in Special Education*. Using a modified, weighted criterion for determining methodologically sound studies, 21 studies were examined based on the degree to which they met identified quality

indicators and EBP standards. Of the 21 studies that were evaluated, three met all eight quality indicators and 11 studies met or exceeded 80% of quality indicators after a weighted criterion to define methodically sound studies was applied. Results from this research demonstrated the majority (52.38%) of studies investigating OTRs were methodologically rigorous. Furthermore, five of the studies identified included three or more cases ($n = 21$) and demonstrated positive effects on student outcomes, with effect sizes demonstrating a large magnitude of effects in the therapeutic direction. Therefore, authors concluded there was sufficient support to consider the use of teacher-directed OTRs across K-12 school settings as an EBP.

In sum, research and existing reviews have supported OTRs as one EBP in classroom management that has shown to be successful in increasing student academic engagement and decreasing disruptive behavior (Common et al., 2020; Haydon et al., 2010; Simonsen et al., 2008, 2014; Sutherland et al., 2003). With recent shifts in instructional delivery models due to the COVID-19 pandemic, educators are in need of EBPs in classroom management now more than ever to actively engage students. Increased OTRs offer educators an effective approach to apply across a variety of learning environments. To date, no study has examined the effects of increased OTRs on student engagement during simultaneous in-person and remote teaching, which presents an important area for research during the pandemic.

Summary

The most efficient and effective method for approaching and improving academic engagement and student behavior in the classroom is through the implementation of EBPs in classroom management (Cooper et al., 2018; Evertson & Weinstein, 2006; Oliver et al., 2011). Researchers have identified specific evidence-based classroom management practices that have demonstrated positive student outcomes, including increasing students' OTRs during teacher-

directed instruction (Haydon et al., 2010; Simonsen et al., 2008, 2014; Sutherland et al., 2003). OTRs are considered an efficient and effective classroom management approach because of the relative ease with which teachers can alter their behavior during instruction to improve outcomes for students (Fitzgerald Leahly et al., 2018; MacSuga-Gage & Simonsen, 2015). Recent research has identified the use of teacher-directed OTRs in K-12 school settings as an EBP (Common et al., 2020). Unfortunately, more often than not, practitioners are provided with limited training in the implementation of EBPs in classroom management (Cooper et al., 2018; Freeman et al., 2014; Oliver & Reschly, 2010), such as OTRs. Therefore, additional research is essential to examine the use of efficient, effective, and sustainable methods for delivering training and coaching to teachers in the use of OTRs and other effective classroom management practices.

Multilevel Professional Development and Coaching

Effective classroom instruction is reliant upon efficient classroom management practices that promote active student engagement, maintain appropriate student behavior, and increase academic achievement (Evertson & Weinstein, 2006; Gage et al., 2017; Korpershoek et al., 2016; Stronge et al., 2011). Unfortunately, not all educators are effective in their delivery of classroom management practices and may require additional professional development (PD) to increase their skills in this area (Allen et al., 2014; Gage et al., 2017). Practitioners have reported when participating in the limited PD and training support they receive pertaining to classroom management, it is often delivered from outside content experts, colleagues, and school-based mentors (Frey et al., 2010; Ficarra & Quinn, 2014). Practitioners also indicated they prefer to engage in consulting with a school-based colleague or mentor when obtaining additional information related to academic and behavioral practices (Clunies-Ross et al., 2008; Ficarra & Quinn, 2014; Tillery et al., 2010). For practitioners to be effective collaborative

resources within their school buildings concerning the implementation of EBPs in classroom management, it is imperative they obtain a reasonable amount of knowledge and skills in this area (Ficarra & Quinn, 2014).

Professional Development

PD can be defined as opportunities to engage in structured professional learning that results in a change in adult behavior (e.g., knowledge, skills, practices) and improvements in students' academic, behavioral, and/or social-emotional outcomes (Darling-Hammond et al., 2017). Research indicates that effective PD is (a) intensive and continuous, (b) targeted to increase content knowledge and outcomes associated with student learning, (c) aligned with and can be integrated into other schoolwide initiatives, (d) structured to include active learning opportunities that enhance working relationships among teachers, (e) embedded within current roles and responsibilities within the school setting, and (f) including ample opportunities to receive performance feedback (e.g., ongoing follow-up, communication, technical assistance; Darling-Hammond et al., 2009, 2017; Desimone, 2009; Garet et al., 2001; State et al., 2019; Yoon et al., 2007). Common forms of PD include workshops and conference sessions, half- and full-day in-service trainings, online modules or webinars, and active participation in professional learning communities (PLCs; State et al., 2019).

Although there are a variety of PD delivery methods, constructing PD systems that adequately support and sustain teachers' use of effective and efficient practices that have been shown to improve student outcomes can be challenging for district and school-based leadership teams (Guskey & Yoon, 2009; Thompson et al., 2012). When selecting a particular PD format, district and school-based leadership teams are frequently faced with the challenge of balancing adherence to best practices in PD and managing the complexity of systems barriers such as time

constraints and allotted funding (State et al., 2019). As a result, inservice training is the most common form of training teachers receive (Kretlow & Bartholomew, 2010).

Inservice training is primarily used to provide instruction to school professionals (e.g., teachers) regarding a particular topic. This method of PD can be presented in brief (e.g., 20-60 min) or extended (e.g., half or full day) formats and is typically designed to be delivered in person to educators (State et al., 2019). Traditional "sit-and-get" inservice trainings generally consist of relatively passive participants who receive knowledge from a content expert delivered in a lecture format (State et al., 2019). Although commonly used, research has shown this format of PD has considerable flaws (Sprick et al., 2006; Thompson et al., 2010). Faults associated with inservice training include the format's (a) tendency for the training to be limited in duration, (b) tendency for the focus to be primarily on knowledge acquisition, (c) inability to be conductive to providing opportunities for fluency building, (d) limited opportunities for participants to receive performance feedback within classroom settings with students (generalizability; Elmore, 2002; Fixsen et al., 2005; Garet et al., 2011; Myers et al., 2011; Thompson et al., 2010; Yoon et al., 2007), and (e) insufficient inclusion of necessary components for sustained implementation (Freeman et al., 2017; Owens et al., 2020; Wei et al., 2009). As a result of these restrictions, researchers have indicated that inservice training alone is inadequate to produce advancements in sustained systems change and increased accuracy of practice implementation (Fixsen et al., 2005; Freeman et al., 2017; Gage et al., 2015; Joyce & Showers, 1995; Lewis & Newcomer, 2002).

Following participation in PD sessions, teachers may encounter a variety of barriers when implementing any new initiative or practice (Kretlow & Bartholomew, 2010). Klinger et al. (1999) investigated the effects of extensive PD on the sustained use of instructional practices with a cohort of seven teachers (i.e., four general education teachers, two special education

teachers, and one part-time enrichment teacher). Teachers in this study participated in comprehensive year-long PD sessions that focused on the use of three target reading practices (i.e., Partner Reading, Collaborative Strategic Reading, Making Words). Klinger et al. used a longitudinal survey to measure the impact of PD on the sustained use of selected instructional practices. Results indicated that all but one teacher continued to implement at least one of the three practices being taught at high rates. However, teachers who participated in the study reported that implementing new practices following PD was challenging based on their perception of not having a firm understanding of the content, inability to retain information as to how to implement the practice with fidelity, and the need for a follow-up training due to the perceived difficulty of implementing the practice in relation to other classroom responsibilities. Similarly, in a study conducted by Kretlow and Bartholomew (2010), teachers reported receiving limited training on schoolwide initiatives and practices and indicated they implemented only the components of practices they perceived to be effective or beneficial. These findings are consistent with previous research and provide further evidence to support the claim that initial group PD may be insufficient in maximizing sustained implementation, despite the extensive PD sessions (Klinger et al., 1999).

Additionally, Kretlow et al. (2011) examined the effects of varied inservice PD supports on the accurate delivery of group instructional units in math with three kindergarten teachers. Participants in this study received a combination of 3-hour inservice training and coaching related to a set of whole-class instructional strategies aimed at improving academic outcomes for students at risk. Individual teachers participated in a series of empirically supported coaching methods (i.e., side-by-side coaching, supervisory follow-up coaching) that consisted of three specific components, one preconference and planning meeting, one side-by-side coaching

session, and one postconference feedback meeting. Using a multiple baseline across subjects design to measure the percentage of correctly implemented group instructional units during 10-min math segments, authors indicated that although teachers demonstrated an increase in level following their participation in the inservice training, a functional relation could not be established and changes in instructional units could not be claimed due to the individual occurrence of the training. However, teachers did demonstrate a second change in level following their participation in coaching, demonstrating a functional relation between teacher implementation of instructional units and coaching. Findings from this study further support the need for recurrent follow up to initial training as a critical component of effective PD.

One year later, Kretlow et al. (2012) conducted a replication study to investigate the effects of PD and coaching supports on the percentage of group instructional units implemented correctly by teachers and the extent to which they generalized the correct implementation to other untrained areas of math. Using the same procedures, teacher participants engaged in one 3-hour group-delivered inservice training, followed by a sequence of evidence-based coaching supports. Authors used a multiple baseline across teachers design to measure teachers' accurate implementation of group instructional units. Although initial results indicated an increase in the number of correct group instructional units following inservice training, data did not indicate a substantial decrease in variability until after all teachers received individual coaching support.

The studies by Kretlow et al. (2011, 2012) have shown an increase in the frequency of teachers' use of evidence-based instructional practices following initial training; however, increased stable levels of implementation fidelity in either study did not occur until teachers participated in at least one individualized coaching session. These studies further support previous research on the insufficiencies of inservice training alone in promoting a sustained

change in teacher behavior (Kretlow et al., 2011; Yoon et al., 2007). Instead, systematic reviews of literature have documented that multicomponent approaches to PD that include explicit teaching, coaching, and performance feedback result in desirable increases in teachers' use of effective classroom management practices (Simonsen et al., 2017).

Coaching

One method for increasing implementation fidelity of evidence-based classroom practices is by providing teachers with coaching support after receiving initial training (Filcheck et al., 2004; Jager et al., 2002; Kohler et al., 1997, 1999; Knight, 2009; Kretlow & Bartholomew, 2010; Kretlow et al., 2011; Lingnuaris-Kraft & Marchand-Martella, 1993; Maheady et al., 2004; Stitcher et al., 2006). Coaching is defined as the supportive interactions and activities conducted by a content expert (e.g., researcher, consultant, university faculty lead facilitator, skilled teacher peer) following initial training that increases the automaticity and rigor with which practices are implemented with fidelity in typical settings (Kretlow & Bartholomew, 2010; Massar, 2017; Massar & Horner, 2015). In a study exploring PD structure, Thompson et al. (2012) identified the following as critical components to be included in a coaching model: (a) implementation of common schoolwide classroom management practices, (b) the use of observational guides, (c) preconference discussions to determine target skill, (d) postconference meetings to collaboratively examine direct observation data, (e) intervention choices based on data, (f) goal setting and follow-up, and (g) repetition of the coaching cycle as needed based on data. By incorporating these components, coaching has been shown to be an effective support in increasing and sustaining teacher implementation of newly acquired instructional practices following initial PD (Cornett & Knight, 2009; Counts, 2019; Fixsen et al., 2005; Gilmour et al., 2017; Joyce & Showers, 2002; Kretlow & Bartholomew, 2010; Mitchell et al., 2017; Reinke et

al., 2014; Reinke et al., 2014). Specifically, numerous studies exist that have examined the effects of coaching on outcomes including teachers' use of evidence-based academic practices (e.g., Jager et al., 2002; Kohler et al., 1997; Stitcher et al., 2006), teachers' use of evidence-based behavior supports (e.g., DiGennaro et al., 2007; Filcheck et al., 2004), and teacher implementation fidelity (e.g., Kretlow et al., 2011, 2012). Kretlow and Bartholomew (2010) conducted a comprehensive review of literature that examined the effects of coaching on preservice and inservice teachers' implementation of EBPs. After completing a thorough electronic search of articles from 1989 to 2009 using multiple online databases and a hand search of studies from 2008-2009 in select journals, researchers identified 13 articles meeting inclusion criteria, which included studies that: (a) were published in peer-reviewed journals; (b) had participants being preservice or inservice teachers in general or special education supporting students in grades preK to grade 12; (c) included coaching (i.e., supervisory or side-by-side) as the independent variable; (d) used a direct, observational measure of identified instructional practices; and (e) conducted coaching in relation to a specific EBP geared towards improving appropriate classroom behavior or academic performance. Results yielded a strong evidence base for increasing teachers' implementation fidelity of EBPs in classroom settings using supervisory and side-by-side coaching.

Further, Kretlow et al. (2012) examined the effects of inservice PD and coaching on teachers' implementation of a combination of whole-class instruction strategies (i.e., model-lead-test [MLT], choral responding, response cards). Teachers initially attended a 3-hour inservice training that provided an overview and instruction on the identified active responding strategies that would be used during a selected portion of the instructional day (i.e., calendar math). Following the whole-group PD session, teachers participated in supervisory coaching session

(i.e., individual preconference) with a member of the research team prior to delivering instruction that included a structured co-planning opportunity and researcher's modeling of select strategies. Next, during one regularly scheduled math lesson, the coach used a side-by-side coaching model to deliver in-class coaching support that included researcher's modeling and prompting for teacher. Once the instructional session was delivered, teachers participated in another supervisory coaching session (i.e., individual postconference) where a member of the research team provided teachers with specific feedback regarding strengths and opportunities for improvement. Using a multiple baseline across teachers design, researchers found a functional relation between inservice training and coaching on teachers' implementation fidelity of three research-based active responding strategies.

Researchers also have applied coaching to support teachers' use of OTRs. Mostly recently, Randolph et al. (2020) investigated the effects of live, remote coaching sessions (i.e., iCoaching) where prompts were delivered by researchers using big-in-ear (BIE) devices to increase teacher-directed OTRs. During instructional sessions that lasted an average of 10 min, researchers provided coaching prompts pertaining to OTRs to teachers via an iPod and Bluetooth earpiece. Once received, teachers immediately delivered the OTR to the specific student mentioned in the coaching comments. Findings suggested that iCoaching produced positive outcomes associated with teacher-directed OTRs and increased levels of student response. Furthermore, Randolph et al. suggested that teacher behavior was impacted by participation in a comprehensive intervention package that included PD and continuous coaching. Teacher participants also reported that having both PD and coaching on OTRs helped to increase their knowledge and support effective practice implementation.

Within any coaching model, the amount of support provided to teachers plays an important role in the effectiveness of coaching. Specifically, research suggests coaching models with 30 or more hours of direct support following the initial training are essential to produce successful outcomes on teachers' use of effective classroom management practices (Grasely-Boy et al., 2019; Yoon et al., 2007). Reinke et al. (2014) evaluated the relationship between coaching supports and implementation of classroom management practices (i.e., behavior specific praise and use of precorrective statements) with 52 elementary teachers. Participants in this study were involved in six 6-hour workshops throughout the duration of the school year, in addition to one individual coaching session up to 1 hour per week. During the coaching session, teachers received specific feedback on implementation fidelity, coaches modeled effective practices, teachers engaged in demonstrations of how to address potential barriers to the delivery of instruction, and coaches supported specific action plan development. Using a longitudinal design to measure the association between coaching supports within the Incredible Years Teacher Classroom Management Program (IY TCM) on teacher implementation of the target classroom management practices, Reinke et al. reported that teachers receiving the 42-hour training and coaching support program (i.e., six 6-hour workshops and 1-hour weekly coaching sessions) demonstrated an increase in their use of targeted proactive classroom management strategies.

In another study, Garet et al. (2001) drew on data collected as part of a national evaluation (i.e., Eisenhour Professional Development Program) to conduct a large-scale evidence-based comparison of effects of various characteristics of PD on teachers' learning. An analysis of ordinary least squares regression provided researchers with the opportunity to examine the relationship between features of PD that have been shown to produce change in teachers' knowledge and skill development and effective classroom teaching practices. Results

from this study suggested various methods for improving PD, one being the implementation of intensive and sustained reform activities (i.e., continuous PD and coaching support). Based on two measures of duration (contact hours and time span), findings also indicated PD and coaching that included longer durations of continued support (i.e., 30+ hours) had considerable positive effects on teacher coherence and opportunities for active learning.

Despite the importance and effectiveness of intensive coaching support with at least 30 contact hours, a program that contains this level of time and resource commitment may be difficult for a majority of schools to implement (Gage et al., 2018; Grasley-Boy et al., 2019). Furthermore, when presented with a range of teacher skills within a single setting, it also may be likely that not all teachers will need the same level of support nor is it feasible for all schools to invest such a substantial amount of support on a regular basis (Gage et al., 2018; Grasley-Boy et al., 2019). For example, Goodnight et al. (2019) examined the effects of inservice training plus coaching on kindergarten teachers' use of research-based strategies during beginning reading instruction. Goodnight et al. trained teachers in the use of research-based strategies (i.e., MLT, unison responding [choral responding, response cards], systematic error correction) to enhance beginning reading instruction. Researchers provided teachers with a one-time inservice training, which was followed up by a number of side-by-side coaching sessions that were delivered by a member of the research team. Results of this multiple baseline across teachers design study indicated that six of the nine teachers who participated in the study were able to improve and maintain their instruction following inservice training; however, three of the teachers required additional coaching support to improve implementation fidelity. Findings from this study suggest there is a need for additional considerations for a more efficient approach to supporting teachers' implementation of effective classroom management practices (Simonsen et al., 2017). Multilevel

PD and coaching is a proposed method of enhancing the feasibility and efficiency of designing and delivering training on evidence-based classroom management practices that includes ongoing embedded coaching supports (Grasley-Boy et al., 2019).

Multilevel PD and Coaching

Multilevel PD is a data-driven systematic model that uses intensifying levels of PD and coaching support to increase teachers' use of research- and evidence-based instructional practices (Darling-Hammond et al., 2017; Grasley-Boy et al., 2019; Owens et al., 2020). Several recent studies have documented results in favor of positive outcomes associated with the implementation of multilevel PD and coaching models (Gage et al., 2017, 2018; MacSuga-Gage, 2013; Simonsen et al., 2017; Wood et al., 2016). Based on a review of select literature, Wood et al. (2016) noted that traditional PD may provide ample support to assist some teachers in the use of newly acquired instructional skills, but for a number of other teachers, increased levels of support and leverage will be needed. Wood et al. proposed the adoption of a multilevel PD and coaching model that is designed to address individual teacher needs while also providing appropriate levels of support to teachers who may require additional assistance to adequately implement EBPs. In another study, Simonsen et al. (2017) investigated the effects of multilevel PD and coaching on teachers' use of behavior specific praise within two elementary schools using a multiple baseline across teachers design. During intervention, the following evidence-based support components were implemented with teacher participants: (a) initial goal setting, (b) daily self-monitoring and opportunities for self-reinforcement, and (c) weekly email prompts. Results indicated a functional relation between targeted PD and an increase in teachers' delivery of behavior specific praise.

Additionally, Bradshaw et al. (2012) examined the effects of an integrated universal (i.e., training) and targeted PD and coaching program (i.e., PBIS*plus*) on the implementation of supplemental supports within a SWPBIS framework with 42 elementary schools. The PBIS*plus* program included custom training in the implementation of cultural proficiency, the student support process, targeted EBPs, and functional behavioral assessments. In addition to tailored PD, participating school teams also received on-site training, consultation, and technical assistance delivered by an external coach to foster continued skill development and support sustained efforts regarding implementation fidelity. Using a 3-year group-randomized controlled trial to evaluate the impact of PBIS*plus* on teachers' implementation of targeted and intensive behavioral supports, researchers reported an increase in the implementation of classroom-based supports and overall student academic performance. Bradshaw et al. suggested that findings from this study demonstrated positive effects associated with staff and student outcomes, and that future research should continue to examine the impact of using an integrated multilevel PD and coaching model.

More recently, Owens et al. (2020) examined the effects of a multilevel coaching model on the implementation fidelity of four general education teachers to facilitate a self-monitoring strategy with students demonstrating persistent off-task behavior in a general education classroom. Participants in this study were first engaged in an initial PD session on self-monitoring strategies. Following this training session, teachers were then included in a multilevel coaching cycle that included the following increasing levels of support: (a) individual coaching; (b) in situ bug-in-ear (BIE); and (c) post-in-situ coaching sessions. Using a multiple probe across participants design to measure the effects of a multilevel coaching model on teacher implementation fidelity, Owens et al. reported a functional relation between the coaching

intervention and teachers' implementation fidelity. Even though a clear functional relation was not found to be present between the teachers' implementation fidelity and students' on-task behavior, an increase in students' overall on-task behaviors was evident.

As reflected in the aforementioned studies, findings suggest that "one-size-fits-all" PD and coaching models may not be appropriate for all teachers, and that offering a continuum of supports to teachers may increase the probability that teachers will actively engage in skills presented during PD. Multilevel coaching models are designed to provide a time- and resource-efficient system structured in a strategic and systematic manner to intentionally incorporate core features of effective PD and continuous coaching support based on teacher needs (State et al., 2019). The multilevel PD and coaching model also serves an important function in facilitating the transition of knowledge and skills acquired by teachers during PD to implementation within the classroom setting (Freeman et al., 2017). However, to maximize the impact of multilevel PD and coaching within the phases of learning (i.e., acquisition, fluency, maintenance generalization, and adoption), there is a need to operationalize the purpose and function of coaching while emphasizing the use of explicit teaching, modeling, prompting, and use of reinforcement (Freeman et al., 2017). In a concept paper on MTSS, Freeman et al. (2017) suggested that within a coaching model, coach-delivered prompting, cueing, and the use of reinforcing and corrective performance feedback can be used to facilitate an increase in phases of learning (i.e., fluency maintenance, generalization, adoption) and encourage continued implementation fidelity. The MTSS framework offers an efficient and effective implementation system for coordinating these elements and promoting high rates of implementation fidelity and sustained use of evidence-based classroom management practices.

Multilevel PD and Coaching within an MTSS Framework

With a growing research base supporting positive student and teacher outcomes associated with coaching as part of a PD practice (Kraft et al., 2018; State et al., 2019) and the use of MTSS as a total school improvement framework for the delivery of evidence-based systems and practices, researchers have begun advising integrating the two (State et al., 2019). Based on the public health model, MTSS provides a framework for schools to align a continuum of academic and behavioral EBPs that are (a) considered universal (Tier 1) and delivered to all students, (b) targeted (Tier 2) and delivered to groups of students with a common target skill area, and (c) intensive and individualized (Tier 3) and delivered to individuals with the most significant need (State et al., 2019). The use of coaching within an MTSS framework is an advantageous approach for systematically supporting teachers' implementation of evidence-based classroom management practices to improve student outcomes (Freeman et al., 2016; Simonsen et al., 2014; State et al., 2019).

Multilevel PD and coaching within an MTSS framework typically consist of three tiers or levels of PD and coaching, each with increasing levels of intensity based on teacher needs (Gage et al., 2017). Tier 1, or universal support, is provided to all teachers and focuses on enhancing skill acquisition (Gage et al., 2017). This single-skill support is designed to be delivered briefly to small or large groups and should focus on one skill at a time (Gage et al., 2017; Grasley-Boy et al., 2019; Simonsen et al., 2014). Following training, teachers are provided with ongoing communication and resources to support self-monitoring of their use of the newly acquired skill (Gage et al., 2017). Following 1 to 2 weeks of intentional skill implementation, skill use is then measured and compared to a predetermined goal (Grasley-Boy et al., 2019). Based on data,

teachers who do not achieve the goal are then provided with additional targeted or individualized supports (Grasley-Boy et al., 2019).

Tier 2, or targeted supports, are designed to be delivered by coaches based on data to teachers who are not responsive to universal supports, as defined by not implementing a skill at a predetermined level (Gage et al., 2017). Teachers who receive targeted supports meet with coaches to receive one-on-one reteaching of the skill, to examine implementation data (i.e., visual performance feedback; Fallon et al., 2015; Gage et al., 2017), and to regularly receive feedback either in-person or virtually (e.g., email) on how to increase their use of the identified skill (Gage et al., 2017). If data do not demonstrate an improvement in teachers' skill development, Tier 3 intensive support may be implemented (Gage et al., 2017).

Tier 3 consists of individualized interventions that have been designed to address the support needs of approximately 5% of teachers (Simonsen et al., 2017). These supports incorporate data-driven, one-on-one skill building sessions that engage teachers in goal setting, action plan development, modeling, opportunities for rehearsal, and the chance to receive performance feedback (Gage et al., 2017; Grasley-Boy et al., 2018; Simonsen et al., 2017).

Current research includes a limited number of studies that have examined the use of multilevel PD and coaching within an MTSS framework (e.g., Gage et al., 2017; Grasley-Boy et al., 2019; Mac-Suga-Gage, 2013; Mullan, 2015; Myers et al., 2011; Simonsen et al., 2014; Thompson et al., 2012). Across these studies, researchers have explored the efficiency and effectiveness of multilevel PD and coaching, while also examining its use in increasing teachers' implementation of evidence-based instructional practices. For instance, Mullan (2015) investigated the effects of multilevel PD and coaching (i.e., Tiers 1-3) within an MTSS framework to increase the fidelity of teachers' implementation of discrete trial training (DTT) in

six preschool classrooms. As a part of the model's universal support, participants were provided with a universal support in the form of a 3-hour workshop that focused on the implementation of DDT. Following the PD session, teacher who did not meet 80% implementation criteria were then provided targeted supports that included peer-mentoring with self-monitoring. If teachers remained unsuccessful in meeting predetermined implementation criteria, they then received twice weekly, 30-min individualized coaching sessions that included specific performance feedback. Using a concurrent multi-treatment, multiple baseline design across teachers to measure the effects of MTSS inspired PD and coaching framework to increase teacher implementation of DTT, Mullan reported a positive relationship between teacher percentage implementation of DTT and multilevel PD and coaching. Additionally, teacher participants reported a positive perception of multilevel PD and coaching as a usable framework for the delivery of information and as a method to receive support within their current setting.

Similarly, Gladney et al. (2021) examined the effects of multilevel coaching (i.e., Tiers 1-3) on three elementary general education teachers' implementation fidelity of culturally responsive social skill instruction and on three African American students' classroom behaviors. Following an initial universal PD training that provided general information on integrating culturally responsive social skill instruction into daily curriculum, teachers in targeted grade levels (i.e., third and fourth grades) actively participated in a grade-level PD during their planning sessions that (a) presented specific lesson plan examples, (b) modeled activities to be embedded within core content, and (c) provided teachers with opportunities to practice activities and receive immediate feedback prior to classroom implementation. After a period of baseline (i.e., post-PD condition), teacher participants then received coaching supports based on their post-PD performance data. Specifically, teachers with 80-89% implementation fidelity were

provided with supervisory coaching sessions, whereas teachers who scored below 80% implementation fidelity received individualized coaching that offered a more frequent and intense level of support. Teachers receiving supervisory coaching participated in 10-15 min coaching sessions three to four times a week following each observation session. During this time, the trainer provided teachers with a brief overview of their lesson that included specific performance feedback, encouragement, acknowledgement of strengths from their lessons, and an opportunity to discuss potential areas of growth. Teachers engaging in individualized coaching participated in 15-20 min coaching sessions following each observation session that included the trainer providing a brief overview of their lesson, an opportunity for teachers to watch and self-evaluate their own lesson in relation to incorporating culturally responsive social skill instruction into their daily curriculum, and specific feedback on lesson plan development, delivery, and reflection. Using a single-case, multiple probe across teacher-student dyads design, researchers reported that after receiving the coaching supports, teachers improved their implementation fidelity and students experienced a substantial reduction in their demonstration of noncompliant behaviors. Furthermore, teacher participants indicated they strongly agreed that culturally responsive social skill instruction positively influenced their students' behavior, and they would recommend the intervention to others. Student social validity data also indicated a positive perception of the integration of culturally responsive social skill instruction within daily instruction and its impact on their behavior in class.

In addition to Mullan's (2015) and Gladney et al. (2021) research, studies also have demonstrated positive findings associated with the implementation of multilevel PD and coaching supports within an MTSS framework that have been shown to increase teachers' use of

specific evidence-based classroom management practices, such as BSP and OTR. A review of the literature in this area follows.

Behavior Specific Praise. A limited number of studies have examined the effectiveness of multilevel PD and coaching within an MTSS framework to increase teachers' use of BSP (Gage et al., 2017). Simonsen et al. (2014) conducted a series of pilot studies to investigate the effects of a multilevel PD and coaching model (i.e., Tiers 1-3) on the implementation of BSP with four middle school teachers. Within the identified data-driven multilevel training support framework, universal supports (i.e., Tier 1) consisted of a schoolwide PD and the encouragement of self-monitoring; whereas targeted supports (i.e., Tier 2) included the use of self-management strategies that were accompanied by weekly email prompts sent by behavior coaches. Teachers requiring individualized supports (i.e., Tier 3) received data-driven consultation that included action plan development, coaching, regular (e.g., weekly, biweekly) direct observations, and performance feedback. Simonsen et al. used a multiple baseline across settings design to examine the effects of the multilevel PD and coaching model within an MTSS framework on teachers' use of BSP. Results indicated varied but positive responses in implementation fidelity across all teacher participations.

Similarly, Myers et al. (2011) evaluated the effects of a systematic, multilevel PD and coaching model (i.e., Tiers 1-3) within an MTSS framework on teachers' rate of BSP with four middle school general education teachers. In this study, researchers designed a multilevel PD and coaching model that focused on providing teachers with a continuum of performance feedback supports that varied in intensity based on the specific need of individual teachers. Within this model, Tier 1 included a handout and verbal recommendations regarding optimal rates of BSP. Tier 2 supports consisted of brief weekly consultation meetings with a coach who shared

performance data and provided praise contingent on teachers' improved rates of delivery, whereas Tier 3 supports included daily performance feedback delivered to teachers by an identified coach. Myers et al. used a multiple baseline across teachers design to measure the effects of multilevel PD and coaching on teachers' rate of BSP. As anticipated based on previous research, findings indicated the delivery of performance feedback resulted in improved teachers' rates of BSP and an overall decrease in student problem behavior. Of the four teachers who participated in the study, one met both performance criteria engaging in the secondary level of intervention (i.e., Tier 2), whereas it was necessary for two others to receive more intensive supports (i.e., Tier 3) to achieve their goals. One teacher was able to meet criteria for one of the identified areas and continued receiving Tier 2 for the duration of the study.

As a systematic replication of Myers et al. (2011) study, Thompson et al. (2012) evaluated the relationship between a multilevel PD and coaching model (i.e., Tiers 1-3) within an MTSS framework to increase teachers' use of BSP with three elementary school teachers. Thompson et al. considered limitations noted in the Myers et al. study to inform the design of their study by (a) selecting elementary general education teachers from a sample of principal-nominated teachers as target participants; (b) conducting the study in a school that was not implementing SWPBIS; (c) including universal training on BSP, self-monitoring at the supplemental level, and individualized coaching at the intensive level; (d) collecting data on teacher-delivered BSP and on-task student behavior; and (e) identifying criteria for teacher praise rates that were confirmed using baseline praise rates with a percentage increase rather than a predetermined rate of praises per minute. Thompson et al. used a multiple probe across participants design to measure the effects of a multilevel PD and coaching model on teachers' rate of BSP. Results indicated the initial inservice PD sessions were unsuccessful in increasing

participants' use of BSP and there was an increase in teachers' use of BSP following their participation in target and individualized supports. Teacher participants also indicated their preference for a multilevel approach to PD and coaching, stating the approach was more effective than a more traditional inservice approach.

More recently, Gage et al. (2017) determined the effects of a multilevel PD and coaching model (i.e., Tiers 1-2) on four general education elementary teachers' use of BSP. Following a universal schoolwide PD session (i.e., Tier 1) on the implementation of BSP, if participants were delivering rates of BSP below a predetermined criterion, they were then provided with targeted PD (i.e., Tier 2). Targeted PD comprised of individual coaching sessions that included (a) a review of BSP, (b) a graphed visual from baseline observations, (c) goal setting associated with the delivery of BSP during a specified instructional block, and (d) weekly emails that provided visual performance feedback. Gage et al. used a multiple baseline across participants design to examine the effects of targeted PD and coaching on teachers' implementation of BSP. Findings indicated a functional relation between multilevel PD and teachers' rate of implementation. Teachers participating in the study demonstrated increased rates of implementation well above the recommended rates and were able to sustain an increased rate over time (e.g., 3 months).

Lastly, influenced by the positive findings of Gage et al. (2017), Gage et al. (2018) conducted a replication study using the same procedures in a different setting to examine the impact of multilevel PD and coaching (i.e., Tier 1-2) on teachers' implementation of BSP with four general education elementary teachers. Specifically, the authors used a multiple baseline across participants design to investigate the effects of universal PD (i.e., Tier 1) and individual skill training followed by ongoing electronic communication (via email) of visual performance

feedback (Tier 2) on teachers' use of BSP. Results showed a functional relation between multilevel supports and teachers' increased use of BSP.

In sum, a minimal number of studies have investigated the effects of multilevel PD and coaching within an MTSS framework to increase teachers' use of BSP (Gage et al., 2017, 2018; Myers et al., 2011; Simonsen et al., 2014; Thompson et al., 2012). Collectively, these studies showed the use of multilevel PD and coaching supports within an MTSS framework has demonstrated improved teacher implementation fidelity and increased rates of BSP, while also displaying decreases in undesirable student behavior.

Opportunities to Respond. In addition to training teachers to implement BSP, one study addressed the use of multilevel PD and coaching frameworks to improve teachers' implementation of OTRs. MacSuga-Gage (2013) examined the effects of multilevel PD and coaching (i.e., Tiers 1-3) on teachers' use of OTRs with five general education elementary teachers. Teachers participated in a simultaneous universal PD session (i.e., Tier 1) that focused on the presentation of OTRs. Following training, if teachers were unable to achieve a predetermined criterion, they received targeted PD. Targeted PD was a supplemental intervention (i.e., Tier 2) that combined self-management strategies with weekly performance feedback via email on teachers' self-monitoring data. Teachers requiring more individualized support would then receive intensive data-based consultation (i.e., Tier 3). Intensive data-based consultation included a review of self-monitoring data, sharing of direct observation data, revisions to current actions plans, and daily performance feedback via email. MacSuga-Gage used a multiple baseline across teachers design to measures the effects of multilevel PD and coaching on teachers' presentation rates of OTRs during teacher-directed phonics instruction. Results indicated high response rates to universal PD support; therefore, no functional relation

could be established between additional supports and a change in teacher behavior. However, data from this study indicated that students demonstrated sustained or increased academic engagement and decreased disruptive behaviors, providing continued support for using multilevel PD and coaching within an MTSS framework as an effective strategy for increasing teachers' implementation of evidence-based classroom management practices.

In sum, the aforementioned studies support that multilevel PD and coaching within an MTSS framework can be used to account for the inconsistency that is present in the knowledge and skills of teachers, and when applied to teachers' acquisition and fluency development, can assist teachers in implementing evidence-based classroom management practices such as BSP and OTRs with increased levels of fidelity that promote positive student outcomes (Gage et al., 2017, 2018; Gladney et al., 2021; MacSuga-Gage, 2013; Mullan, 2015; Myers et al., 2011; Simonsen et al., 2017; Simonsen et al., 2014; Thompson et al., 2012).

Despite promising literature on the use of multilevel PD and coaching models within an MTSS framework, a number of limitations in this area of research necessitate discussion. First, in order to support teachers who may need and benefit from varying levels of PD and coaching supports to achieve desired outcomes, researchers consistently suggested that further research is needed to examine issues related to contextual fit and social validity within a multilevel PD and coaching model that address teachers' implementation of effective classroom management practices (Gage et al., 2017, 2018; MacSuga-Gage, 2013; Simonsen et al., 2017; Wood et al., 2016). Next, current research in this area has been examined primarily at the elementary and middle school levels, with the use of university-based researchers as implementers, (e.g., trainers, coaches, evaluators) rather than natural implementers. As a result of this, researchers have identified a need for additional research to be conducted that examines the use of multilevel

PD and coaching within an MTSS framework at the high school level with the use of natural coaches in an effort to address financial constraints schools may experience in relation to PD (Gage et al., 2017, 2018; MacSuga-Gage, 2013; Myers et al., 2011; Randolph et al., 2020; Simonsen et al., 2017; Thompson et al., 2012; Wood et al., 2016). Finally, although current research provides support for using multilevel PD and coaching to increase teachers' use of BSP or delivery of culturally responsive social skill instruction, only one study exists that examined the model when applied to OTRs (MacSuga-Gage, 2013).

Summary

Teacher behavior has a direct impact on student behavior (e.g., Myers et al., 2011; Simonsen et al., 2008); therefore, favorable classroom instruction is dependent upon the use of effective instructional practices to promote appropriate student behavior, increase academic engagement, and academic achievement (Gage et al., 2017; Grasley-Boy et al., 2019; Myers et al., 2011). Unfortunately, the reality is that not all teachers have received instruction in these areas and may require additional training to improve their use of effective and efficient practices that have been shown to improve outcomes for students (Gage et al., 2017). Although there are several PD models, inservice training is the most common form of PD teachers receive (Kretlow & Bartholomew, 2010); however, research has strongly indicated that passive group PD sessions may not be sufficient in maximizing a sustained change in teacher behavior. In response to these findings, researchers propose the most effective PD models include continued support in the form of sustained coaching for participants (Fixsen et al., 2005; Grasley-Boy et al., 2019). Based on the potential range of continued support teachers may require, researchers are now suggesting that "one-size-fits-all" PD and coaching models may not be appropriate for all teachers, and offer a potential solution in the form of a continuum of supports that may increase the likelihood

that teachers will actively engage in skills presented during PD (Wood et al., 2016). Research has recently examined the use of an MTSS framework as an efficient and effective model for providing multilevel PD and coaching supports to teachers aimed at increasing their use of evidence-based classroom management practices, including the use of BSP and OTRs. Aligned with the same tiered logic that is used to provide academic and behavioral supports to students, multilevel PD and coaching models are based on frequent observations, ongoing progress monitoring, and continued use of data-based decision making to inform instruction and to identify appropriate levels of support (Grasley-Boy et al., 2019). As a cost-effective, resource efficient, and potentially sustainable framework for increasing teacher use and implementation fidelity of EBP in classroom management, additional research is needed to further examine the effects of multilevel PD and coaching models within an MTSS framework on teachers' use of EBPs in classroom management, particularly OTRs, in high school level.

Summary of the Review of Literature

As a result of various academic, behavioral, and social-emotional challenges that adolescence may experience during high school, an alarming rate of students are not acquiring high school credentials. Researchers have suggested dropout prevention efforts should focus on the use of a proactive, systematic, multitiered systems of support framework (Freeman et al., 2015; Lee & Burkam, 2003; Lehr et al., 2003; Mac Iver, 2011) such as SWPBIS. However, at the secondary level, high schools are faced with three unique contextual characteristics, including school size, student developmental level, and an organizational culture that prioritizes academic growth, making SWPBIS implementation more challenging at this level when compared to elementary or middle schools. Even when presented with these unique challenges, existing research addressing SWPBIS implementation at the high school level has demonstrated

feasibility and effectiveness in producing positive academic and behavioral outcomes when implemented with fidelity (Bohanon et al., 2006: Bradshaw et al., 2015; Flannery et al., 2013, 2014; Freeman et al., 2015, 2019).

A critical component of universal practices within SWPBIS is the ability to manage student behavior during instructional time within the classroom setting. To maximize instructional time for students, one of the most efficient and effective methods for improving academic engagement and student behavior in the classroom is through the implementation of EBPs in classroom management (Cooper et al., 2018; Evertson & Weinstein, 2006; Oliver et al., 2011). Researchers have identified specific evidence-based classroom management practices that have demonstrated positive student outcomes, including increasing students' OTRs during teacher-directed instruction (Haydon et al., 2010; Simonsen et al., 2008, 2014; Sutherland et al., 2003). Unfortunately, practitioners often are not provided with adequate amounts of training in the implementation of EBPs in classroom management (Cooper et al., 2018; Freeman et al., 2014; Oliver & Reschly, 2010), such as OTRs. Therefore, it is imperative that additional research examines the use of efficient, effective, and sustainable methods for delivering training and coaching to teachers in the use of OTRs and other effective classroom management practices.

Although there are several PD models to support teachers' skill and knowledge development, inservice training is the most common form of PD teachers receive despite that there is evidence supporting passive group PD sessions being insufficient in maximizing a sustained change in teacher behavior (Kretlow & Bartholomew, 2010). In response to these findings, researchers propose the most effective PD models include continued support in the form of sustained coaching for participants (Fixsen et al., 2005; Grasley-Boy et al., 2019). Specifically, researchers have noted that "one-size-fits-all" PD and coaching models may not be

appropriate for all teachers, and that there is a need for varying levels of coaching supports to ensure teachers will actively engage in skills presented during PD (Wood et al., 2016). Researchers have recently examined the use of an MTSS framework as an efficient and effective model for providing multilevel PD and coaching supports to teachers aimed at increasing their use of evidence-based classroom management practices, including the use of BSP (Gage et al., 2017, 2018; Myers et al., 2011; Simonsen et al., 2014; Thompson et al., 2012) and OTRs (MacSuga-Gage, 2013). Aligned with the same tiered logic that is used to provide academic and behavioral supports to students, multilevel PD and coaching models are based on frequent observations, ongoing progress monitoring, and continued use of data-based decision making to inform instruction and identify appropriate levels of support (Grasley-Boy et al., 2019). As a cost-effective, resource efficient, and potentially sustainable framework for increasing teacher use and implementation fidelity of EBP in classroom management, additional research is needed in this area to further examine the effects of multilevel PD and coaching models within an MTSS framework, particularly with the use of OTRs at the high school level.

CHAPTER 3: METHOD

In this study, I used a quantitative experimental single-case, multiple baseline across participants design (Cooper et al., 2020; Ledford & Gast, 2018; What Works Clearinghouse, 2020) to analyze the effects of multilevel training and coaching on high school teachers' use of OTRs during teacher-directed instruction. I also examined the effects of teachers' implementation of OTRs on high school students' levels of active engagement during teacher-directed instruction. The sections to follow include a description of the participants, setting, materials, dependent variables and data collection methods, research design, procedures associated with experimental conditions, procedures to measure social validity and procedural fidelity, and procedures for data analysis.

Participants

Participants in this study included one school-selected, systems-level personnel (i.e., instructional coach), three general education high school teachers, and two high school students (grades 9-12) per participating classroom. For this study, I used convenience sampling to select participants. Selection of the instructional coach was based on principal recommendation in identifying systems-level personnel who had at least 5 years of teaching experience and who was currently serving in a role that provided professional development and coaching support to teachers. The inclusion criteria for teachers included (a) principal recommendation of teachers who needed support with providing students with increased rates of OTRs during instruction and (b) low rates of OTRs (i.e., below 3 OTRs per minute) during instruction based on pre-baseline observational data. The inclusion criteria for students included: (a) being identified by teachers as demonstrating consistent low levels of academic engagement for at least 50% of the time

during teacher-directed instruction; (b) spending at least 80% of the instructional day in general education with at least a 60% attendance record from the previous semester; and (c) being identified as demonstrating a high rate of academic disengagement (less than or equal to 0.5 per min) based on pre-baseline observational data. Participating teachers self-identified one instructional block to be examined during the study based on their perception of low levels of student engagement. Classroom teachers nominated students based on the above criteria (a) and (b) to be eligible participants in the study. Teachers confirmed the percentage of student attendance and student course schedule using the school's data management system (i.e., PowerSchool). Additionally, the systems-level personnel and I conducted two pre-baseline observations to verify students' level of disengagement during a teacher-identified direct instruction period (described in the *Procedures to Confirm Student Eligibility* subsection).

Recruitment of Participants

As the experimenter, I recruited a school administrator through email correspondence and a video conference using a recruitment script (Appendix A) to provide information related to the study. Once the school administrator confirmed his interest in his school's participation in the study, the school administrator provided a letter of support (see Appendix B) that indicated his commitment and identified an instructional coach to serve as the primary interventionist for the study. After the principal identified a potential instructional coach, I then recruited the coach through email correspondence and a video conference using a recruitment script (Appendix C). Following the initial schoolwide training session, I recruited teachers based on principal recommendation through email correspondence and a video conference using a recruitment script (Appendix D). Accompanied by an introductory email, I electronically sent informed consent forms to the instructional coach (Appendix E) and the identified teachers (Appendix F)

to review and provide digital signatures if they choose to participate. Due to COVID-19 restrictions that prevented researchers from visiting schools, I conducted data collection virtually as it was critical to video or audio record training, coaching, and instructional sessions to ensure adequate data collection. Thus, the participating instructional coach and teachers also signed a video/audio release form (Appendix G). Using electronic signature software (i.e., DocuSign), participants confirmed their electronic signatures, and signed documents were automatically returned to me electronically. The instructional coach and teachers also had the option to receive a consent packet (including consent forms and video-audio release form) and mail their signed forms to me in a prepaid return envelope.

Once teachers had agreed to participate in the study, they completed an experimenter-created setting and participant information form (Appendix H). This form prompted the teacher participants to provide demographic information pertaining to their teaching experience and the general makeup of their class. At this time, I also scheduled a video conference with the instructional coach and teachers to guide teachers through the student recommendation process. During the video conference, I provided participants with a visual representation and virtual document outlining student participant inclusion criteria for the study. After answering questions pertaining to student inclusion criteria and confirming participants' understanding of the student selection process, I then explicitly defined pre-baseline, baseline, and intervention data collection procedures. After teacher identified students as potential participants, I provided them with electronic access to a parental consent form (Appendix I), student assent form (Appendix J), and the audio/video release form (Appendix G). Teachers were then asked to send potential student participants' parents/guardians an introductory email (Appendix I) providing an overview of the study, along with electronic copies of the aforementioned documents for their review and to

provide digital signatures if they agree to participate in the study. Potential student participants and their parents used electronic signature software (i.e., DocuSign) to provide their signature. If consent forms were not received after 2 weeks, I made another attempt by following the same procedures as the first round. If there was no response from a student after 1 additional week, I assumed the student was not interested in participating in the study. Potential student participants and parents/guardians also had the option to receive a consent packet and mail their signed forms to me in a prepaid return envelope.

Procedures to Confirm Student Eligibility

In addition to the teacher recommendation and consent/assent process, student participants were also required to meet additional inclusion criteria. First, the instructional coach and I conducted two 10-min pre-baseline observations in the identified general education classrooms to verify the nominated students met the inclusion criteria. As the observers, we used an experimenter-developed data collection form (Appendix K) to record students' level of academic engagement. Event recording was used to determine the rate of students' active participation during teacher-directed instruction. The rate was calculated according to the total number of active responses divided by the total number of OTRs that occurred during teacher-directed instruction (i.e., # of active responses / # of total OTR). Students who demonstrated disengagement at a rate less than or equal to 0.5 responses per min for both 10-min pre-baseline observation sessions were confirmed as meeting participant inclusion criteria. Preference was given to students who responded even though the rate of OTRs remained low. This preference was given as these data initially indicated fewer barriers to students' demonstration of active response, presenting an opportunity to see the impact of increased rates of OTRs on student academic engagement.

Teacher Participants

Once Institutional Review Board (IRB) and county approval were obtained to conduct research, one instructional coach and three teachers (pseudonyms used throughout) were selected and confirmed. However, one teacher withdrew from the study after 2 weeks post-PD sessions citing increased job responsibilities (e.g., planning for different instructional delivery models, changes in student attendance policies, lack of parent involvement) and "added stress" due to COVID-19. Thus, one instructional coach (Ms. Wilson) and two teachers (Mr. Sanderson and Ms. Kent) participated in the study.

Ms. Wilson. Ms. Wilson was a 30-year-old White female with 9 years of teaching experience, five of which have included being in various systems-level support roles providing PD and coaching support to teachers. Ms. Wilson completed her bachelor's degree in secondary education and a master's degree in curriculum and instruction. She also held state certifications in secondary and middle level math and was a Google Certified Educator and Trainer. Ms. Wilson reported having previously used online programs with multiple choice and free response options and interactive white boards as strategies to increase student engagement during times of teacher-directed instruction. She also indicated only having received direct training on coaching as a part of this study.

Mr. Sanderson. Mr. Sanderson was a 35-year-old White male in his 7th year as a general education social studies teacher. Mr. Sanderson held a bachelor's degree in secondary education, a master's degree in curriculum and instruction, and state certifications or endorsements in Social Studies, grades 9-12, Advanced Placement (AP) History, Gifted/Talented Education, and Read to Succeed. At the time of the study, Mr. Sanderson taught social studies (i.e., U.S. History), was the head of the social studies department, and served as a peer mentor. Mr. Sanderson reported

previously using various strategies to increase student engagement during teacher-directed instruction, including (a) Think-Pair-Share, (b) showing brief engaging videos, (c) sharing real world stories, (d) having students critically think about content during small and whole group discussions, and (e) presenting movement activities for students to demonstrate their understanding. Prior to participating in this study, Mr. Sanderson indicated he had attended one faculty meeting led by a school administrator that provided PD on strategies for increasing student engagement during teacher-directed instruction.

For the study, Mr. Sanderson selected to target student engagement in his second block, 11th grade U.S. History Honors class as his primary instructional block. This block included 20 students (4 female and 16 male), ranging in ages from 16 to 18 years old. Of those students, 17 were identified as White, one was identified as Native Asian, and two were identified as Hispanic. Mr. Sanderson also identified his first block, 11th grade U.S. History class to serve as his generalization setting.

Ms. Kent. Ms. Kent was a 24-year-old White female in her first year as a teacher. Ms. Kent completed her bachelor's degree in Psychology and has a Master of Arts in Teaching with an initial state teaching licenses in secondary education (i.e., Social Studies, grades 9-12). At the time of the study, Ms. Kent taught social studies (i.e., Government and Economics) and indicated she often used the following strategies to increase student engagement during teacher-directed instruction: (a) Think-Pair-Share, (b) requesting students elaborated on their initial answers, and (c) providing students with interactive notes. Ms. Kent also reported she had received two PD sessions on increasing active student engagement prior to school starting in the fall, one offered by the district, and one presented at her school.

For the study, Ms. Kent selected to target student engagement in her multi-grade, second block, U.S. History and Constitution class as her primary instructional block. This block included 23 students (8 female and 15 male), ranging in ages from 15 to 17. Of those students, 10 were identified as White, seven were identified as Black or African American, two were identified as Asian, one was identified as Native Hawaiian or Other Pacific Islander, and three were identified as Other. Additionally, 7 out of the 23 students qualified for some form of educational supports or services under Section 504 of the Rehabilitation Act or IDEA (2004). Ms. Kent identified her multi-grade, fourth block, U.S. History and Constitution class to serve as her generalization setting.

Student Participants

The two teacher participants (i.e., Mr. Sanderson and Ms. Kent) identified a total of four student participants (pseudonyms used throughout), two per classroom, based on students' low levels of active engagement and meeting inclusion criteria as defined above. Abigail was a 17-year-old White female and Max was a 17-year-old White male. Both Abigail and Max were juniors in high school at the time of the study and were enrolled in Mr. Sanderson's second block, 11th grade U.S. History class. Piper was a 16-year-old White female, a sophomore in high school at the time of the study. Kade was a 17-year-old White male, a junior in high school at the time of the study. Both Piper and Kade were enrolled in Ms. Kent's second block, U.S. History and Constitution class.

Setting

This study took place in a public high school (grades 9-12) that had been implementing SWPBIS with fidelity (i.e., score of 80% or better in Tier 1 on the Tiered Fidelity Inventory [TFI; Algozzine et al., 2019]) for at least one year and was in an urban school district in the

southeastern United States. The TFI is a valid, reliable, and efficient evaluation measure school-based teams use to determine the extent to which school personnel are applying core features of SWPBIS (Algozzine et al., 2019). This instrument is designed to be used over time for guiding implementation and sustained use of SWPBIS (Algozzine et al., 2019). It was important for the school participating in this study to have high implementation fidelity for Tier 1 as this meant the school had already confirmed a SWPBIS team that had worked to identify and communicate intended schoolwide academic and behavioral outcomes, determined relevant data sources for monitoring these outcomes, established systems to support adult behavior, and were prepared to work collaboratively to implement evidence-based schoolwide and classroom-based practices to support student behavior (Simonsen & Myers, 2015). Having a foundation of universal supports aided teachers in restructuring their classroom environments to ensure active engagement, and prosocial behaviors were more likely to occur when increasing their rate of OTRs.

Teachers' primary instructional blocks for implementation of OTRs and primary data collection for teacher implementation fidelity and students' academic engagement occurred in Mr. Sanderson's second block, 11th grade U.S. History Honors class, and in Ms. Kent's multi-grade, second block, U.S. History and Constitution class. The generalization settings included Mr. Sanderson's first block, 11th grade U.S. History class, and Ms. Kent's multi-grade, fourth block, U.S. History and Constitution class. Throughout each phase of the study, both teachers provided students with in-person, face-to-face instruction.

Data collection on teachers' delivery of OTRs and students' active engagement occurred virtually within general education settings during teacher-directed instruction. For this study, general education setting was defined as (a) a classroom where academic and behavioral instruction occurred for all students (i.e., with and without students with disabilities), (b) there

were more students without disabilities than those with disabilities, and (c) there was a general education teacher present for the entire block of instruction. Teacher-directed instruction was defined as the first 10 min of a class period which included (a) gaining students' attention, (b) stating the goal of the lesson, (c) reviewing critical prerequisite skills, (d) modeling of the target skill, and (e) prompted or guided practice (Archer & Hughes, 2011). Teacher-directed instructional settings were video and audio recorded for data collection purposes. The video and audio recordings were used to (a) capture teachers' delivery rate of OTRs and students' active response rate, (b) provide in-time coaching feedback, and (c) collect interobserver agreement data.

Throughout the duration of the study, training sessions for Ms. Wilson, schoolwide training, and coaching sessions took place virtually. Once confirmed as participants, Ms. Wilson, Mr. Sanderson, and Ms. Kent were assigned a university identification number and provided with electronic access to a secure learning management system (i.e., Canvas). Embedded within Canvas, participants had access to an electronic platform (i.e., GoReact) that was used to deliver and record training session for the instructional coach and ongoing coaching sessions for the teachers. In effort to ensure all staff members had access to the schoolwide training, Ms. Wilson conducted and record the training session using a school-approved video conferencing system (i.e., Google Meet).

Experimenter and Interventionist

I served as the primary experimenter for this study. I was a doctoral candidate licensed in general education (K-6) and special education (K-12) in North Carolina with 7 years of experience at the school level, in addition to 6 years at the district level. I had previously received extensive training in coaching and technical assistance, classroom management skills,

and multitiered systems of support (MTSS). As the experimenter, I was responsible for (a) obtaining IRB approval; (b) developing a data-based multilevel PD and coaching model; (c) coordinating approval with district and school-level administration; (d) recruiting participants; (e) delivering training, materials, and coaching support to the school-based instructional coach; (f) coordinating data collection across all phases; and (g) serving as primary observer and trainer for outside observers when collecting interobserver agreement, procedural reliability, and fidelity data.

The primary interventionist in this study was Ms. Wilson, a school-based system-level personnel, with 9 years of experience in teaching and who was currently serving in a role that provided professional development and coaching support to teachers. The role of the interventionist included participating in a 20-min live virtual training session with the experimenter, delivering a 30-min live virtual schoolwide PD session, facilitating a 15-min synchronous video conference for teacher participants, serving as the primary data collector, and facilitating targeted and individualized coaching sessions with teachers.

Dependent Variables and Measurement

The primary dependent variable was teacher implementation fidelity of OTRs at an acceptable rate during teacher-directed instruction. The secondary variable was students' level of academic engagement. Data collection occurred during 10-min teacher-directed instruction during which a teacher gained students' attention, stated the goal of the lesson, reviewed critical prerequisite skills, modelled the target skills, and prompted or guided practice. I selected this portion of the lesson because teacher-directed instruction has been shown to have a direct positive influence on student achievement and to be a factor in maximizing impact on student learning (Hattie, 2012). More specifically, teacher-directed instruction focuses on providing

demonstrations of desired skills and descriptions of the actions being performed during instructional decision making (Archer & Hughes, 2011). After providing an initial model of desired strategies or skills, it is suggested that subsequent models involve active student participation using effective questioning (Archer & Hughes, 2011). Incorporating questions into teacher-directed instruction serves three primary roles: (a) keeping students actively involved in the learning process, (b) increasing opportunities for students to rehearse essential academic content, and (c) verifying student understanding and offering additional opportunities for students to receive feedback (i.e., praise and error correction; Archer & Hughes, 2011). Although, teacher-directed instruction is designed to actively involve students, it is often presented in a manner that requires students to be passive participants for extended periods of time. Therefore, keeping students actively involved in their learning is essential. In addition to targeting a specific portion of the lesson plan, the decision to conduct 10-min observations was made based on the research-based recommendation that teacher-directed instruction at the secondary level should be delivered for anywhere between 10 to 15 min (Jenson, 2005). Furthermore, research has found that greater reliability can be achieved using a larger number of shorter, independent observation periods that are conducted using a fixed total observation time (Rowley, 1978). Correlational data have also demonstrated that these brief observational sessions may also be representative of behaviors occurring throughout a longer duration (e.g., whole day; Rowley, 1978).

Teacher Implementation Fidelity of OTR

For the purpose of this study, OTR was operationally defined as the teacher providing the group or class with an OTR to a question or direction. This included any time the teacher asked a question (e.g., "Who can…?") or gave a direction (e.g., "Show me...") to prompt student

response that were either: (a) verbal (e.g., answering a question), (b) gestural (e.g., raising their hand if they agree with a statement), or (c) written (e.g., writing a response). To be considered an OTR, student responses had to be related to academic content being taught and not for behavioral issues (e.g., "Why are you out of your seat?") or directions unrelated to academic curriculum (e.g., "Get out a pen or pencil.").

When collecting teacher implementation fidelity of OTRs, observers used live video recordings through a virtual external tool called GoReact. GoReact is an interactive cloud-based platform that is used to support the virtual teaching of performance-based skills (GoReact, n.d.). Teachers used a video recording device to capture live demonstrations of teacher-directed instruction during an identified a priori instructional block. GoReact was then used to securely store video recordings and serve as a virtual consultation platform. The electronic platform also allowed the interventionist (i.e., Ms. Wilson) to provide teachers with time-coded text, video, and audio feedback regarding the delivery method, number, and types of OTRs that were used throughout the duration of each recorded lesson.

Teacher implementation fidelity data were collected three times a week and measured using the Teacher's Implementation of OTR Fidelity Checklist and Student Observation Form (Appendix K). Event recording was used to measure teachers' use of OTRs (i.e., verbal, gestural, written, or mixed), the accuracy in their delivery, and the rate at which OTRs were being delivered during the teacher-directed instruction portion of an academic lesson. The number of OTRs were divided by the number of minutes during teacher-directed instruction to determine the rate of OTRs presented by the teacher during the observed instructional session (i.e., # of OTR / # of min). Teacher implementation fidelity data were reported and examined in two ways: (a) based on the total number of required procedural components (i.e., including the required,

acceptable rate of OTRs) and (b) according to the actual number of procedural components each teacher completed correctly. Both types of teacher implementation fidelity data were determined by dividing the number of steps implemented correctly by the number of applicable steps (i.e., total or actual) and multiplying by 100 to yield a percentage.

Student Academic Engagement

Students' academic engagement was defined based on the work of MacSuga-Gage and Gage (2015) as students actively participating in classroom activity (e.g., writing, raising hand, answering a question [individual or choral response], talking about a lesson, interacting with a peer as directed). Academic engagement was measured during 10-min teacher-directed instruction using event recording and was documented on the Teacher's Implementation of OTR Fidelity Checklist and Student Observation Form (Appendix K). The rate of students' academic engagement was determined based on the total number of active responses divided by the number of instructional minutes that occurred during teacher-directed instruction (i.e., # of active responses / # of min).

Teachers' delivery of OTRs and students' demonstration of academic engagement was recorded across all phases of the study through direct observation using GoReact and documented on the Teacher's Implementation of OTR Fidelity Checklist and Student Observation Form (Appendix K). This form included sections for (a) the date of observation; (b) teacher's name; (c) observation period; (d) indications of OTRs (i.e., yes, no); (e) procedures for accurate delivery of OTRs (i.e., input, prompt/question, monitoring, feedback); (f) type of OTRs (i.e., verbal, written, gestural); and (g) demonstration of academic engagement (i.e., yes, no). Observers recorded items (d) through (g) for each minute of the instruction to allow for accurate data collection for measuring interobserver agreement. Observers conducted virtual observations

of teacher and student participants using GoReact during the identified instructional block for up to 10-min while teacher-directed instruction was occurring. During that time, event recording was used to gather data across one-minute intervals. At the end of observation sessions, teachers' percentage of implementation fidelity were determined by adding up the number of correctly delivered OTRs and dividing that number by both the total and actual number of applicable steps and multiplying those numbers by 100 (i.e., # of Yes / # of applicable steps x 100). Teachers' delivery rate of OTRs were measured by dividing the number of OTR by the number of minutes during teacher-directed instruction to determine the rate of OTR delivered by the teacher during that instructional session (i.e., # of OTR / # of min). Finally, a rate of students' academic engagement was calculated based on the total number of active responses divided by the total number of instructional minutes that occurred during teacher-directed instruction (i.e., # of active responses / # of min).

Interobserver Agreement

The experimenter and another approved member of the research team (i.e., doctoral candidate) collected interobserver agreement (IOA) data for 46% of the observational sessions across all experimental conditions for all dependent variables (i.e., teacher implementation fidelity of OTR and student academic engagement). I trained the additional observer using legal publicly released online videos of teachers and students in classrooms until the observer met 85% agreement criterion. The trained observer and I conducted behavioral observations using the same live recordings and the same recording method as the interventionist (i.e., instructional coach) during teacher-directed instruction. Following each observation session, differences in the total number of behaviors were calculated using the point-to-point method: (total number of agreements / number of agreements plus disagreements) x 100. This number indicated a

percentage agreement based on interobserver data. The IOA data were to demonstrate a percentage of at least 85% across all experimental conditions to be acceptable (Saal et al., 1980). Had this percentage not been met, I would have provided additional training to the observer until agreement of at least 85% had been achieved.

Experimental Design

In this study, I used a quantitative experimental single-case, multiple baseline across participants design (Cooper et al., 2020; Ledford & Gast, 2018; What Works Clearinghouse, 2020) to measure the effects of multilevel coaching on teachers' implementation of OTRs during teacher-directed instruction and student behavior. One of the many benefits of single-case research is that it uses within- and between-subjects comparisons to control for major threats to internal validity and requires systematic replication across different conditions, participants, and/or measures of the dependent variable to enhance external validity (Horner et al., 2005; Kratochwill et al., 2010; Martella et al., 1999). In a multiple baseline across participants design, the teacher with the most stable baseline entered the intervention first. When the first teacher participant demonstrated three consecutive sessions showing increases above baseline in implementation fidelity (including the number of OTRs delivered during teacher-directed instruction), the second participant with the most stable baseline performance entered the intervention condition next. The intervention would conclude once each participant demonstrated a rate of three or more OTRs per minute with the completion of at least 90% of steps during teacher-directed instruction across three consecutive sessions. Based on the study's design and per WWC guidelines to demonstrate concurrency (Kratochwill et al., 2010), at least five baseline data points were collected prior to the intervention condition. Decisions to change a condition were made based upon the teachers' implementation fidelity dependent variable.

Procedures

The experimental procedures for this study included pre-baseline, participant training, baseline, multilevel coaching, maintenance, and generalization. I described each of these conditions below.

Pre-baseline

During pre-baseline, teacher participants recorded two 10-min instructional sessions using school-approved video conferencing system (i.e., Google Meet) during a previously identified instructional block. While observing these sessions virtually through GoReact, the instructional coach and I measured student engagement using event recording and documented incidences of academic engagement on the Teacher's Implementation of OTR Fidelity Checklist and Student Observation Form (Appendix K). The rate of students' academic engagement was determined based on the total number of active responses divided by the total number of OTRs that occurred during teacher-directed instruction (i.e., # of active responses / # of total OTR). Teachers were instructed to deliver their lessons as usual.

Participant Training (Tier 1)

I delivered a 25-min live virtual training session to provide the interventionist (i.e., instructional coach, Ms. Wilson) with a brief introduction to OTRs and its effectiveness as a classroom management skill to increase active student engagement and decrease inappropriate classroom behaviors. Specifically, the training included (a) a definition and example of each of the three types of OTRs (i.e., verbal., gestural, written); (b) various examples of different types of OTRs; (c) an opportunity to provide own examples of various OTRs; (d) an outline for the appropriate delivery skills when presenting an OTR; (e) how to rate student behavior; (f) procedures for collecting teacher implementation data and students' active response; (g) how to

use GoReact as a virtual coaching tool (e.g., annotating live lessons, scheduling and recording virtual coaching sessions); (h) a chance to provide specific feedback based on the training session; (i) time to discuss how a similar PD session would be delivered to schoolwide staff; and (j) the materials needed to deliver the agreed upon schoolwide PD session to school staff. Additionally, the interventionist and I collaboratively reviewed the procedural steps included in the Coach-led Schoolwide Professional Development Fidelity Checklist (Appendix S). Prior to ending the training session, the interventionist engaged in practice opportunities to check for adequate understanding and confirm she was able to provide a variety of examples and types of OTRs and deliver appropriate feedback when conducting the schoolwide training. I answered any questions the interventionist had during this time.

Following the interventionist training session, the interventionist provided a virtual 30-min schoolwide PD session to all certified teachers during an agreed upon time (i.e., after school staff meeting). This PD opportunity provided teachers with (a) an introduction to background research on the use of OTRs and how OTRs can be used to increase students' academic engagement and decrease students' inappropriate classroom behaviors, (b) examples of the various types of OTRs, (c) an outline of the delivery skills that should be present when delivering OTRs, (d) a more in-depth examination of classroom data to support the need for incorporating OTRs into daily instruction, (e) how to incorporate OTRs into teachers' instructional delivery, (f) a chance to ask any questions related to the delivery of OTRs, and (g) encouragement to increase rates of OTRs during teacher-directed instruction following participation in the PD. In addition to providing teachers with information pertaining to OTRs, the interventionist provided a structured setting for teachers to practice implementing the use of OTRs and receiving immediate feedback prior to classroom implementation. During the training,

teachers were divided virtually into small breakout groups where they practiced delivering various types of OTRs while receiving feedback from peers. In addition to peer feedback, the interventionist joined each breakout group to support participants to the extent possible in the delivery of components that are included when presenting OTRs. A primary focus of the schoolwide PD session was on how to successfully integrate OTRs into teachers' current academic instructional delivery methods. Teachers were provided with electronic access to a recording of the schoolwide PD session along with session materials following their participation in the PD. Given that teachers already present some form of limited OTRs in their classrooms, they were given 2 weeks to apply the strategy they learned and implement a variety of OTRs during teacher-directed instruction at an increased rate using appropriate delivery methods prior to gathering baseline data.

Once teachers had agreed to participate in the study, they participated in a 15-min synchronous video conference held by Ms. Wilson that included information on how to (a) record instructional sessions using either GoReact or the school-approved video conferencing system (i.e., Google Meet), and (b) view instructional feedback and participate in virtual coaching sessions using either GoReact or the school-approved video conferencing system (i.e., Google Meet). The webinar included an opportunity for teachers to ask questions and receive answers regarding data collection procedures and their participation in coaching sessions. In addition to receiving electronic access to the recorded video conference, teachers received participant notes with explicit directions on how to access, view, and participate in coaching sessions.

Baseline (Post-PD)

For 2 weeks following the schoolwide PD session, the interventionist sent all teachers weekly reminders via email regarding OTRs and how OTRs can be used to effectively increase student engagement and decrease inappropriate classroom behaviors. These weekly communications (Appendix L) provided recipients with a reminder of the (a) positive outcomes associated with the implementation of high rates of OTRs, (b) definition and different types of OTRs, (c) delivery skills that need to be present when providing students with OTRs, and (d) schoolwide instructional goal of delivering at least three OTRs per min during teacher-directed instruction. These emails were intended to serve as an additional schoolwide, universal support for teachers by providing a general precorrection to maximize the likelihood that teachers would intentionally include and increase their delivery rates of OTRs during teacher-directed instruction (Archer & Hughes, 2011; Colvin et al., 1993).

In addition to receiving weekly communications, teachers participating in the study recorded three instructional sessions per week for 2 weeks using either GoReact or the school-approved video conferencing system (i.e., Google Meet) for a total of five sessions. The interventionist and I observed these recorded sessions to determine teachers' level of implementation fidelity, teachers' delivery rate of OTRs, and students' rate of academic engagement. If teachers demonstrated 90% of steps with fidelity and an overall rate of three or more OTRs per minute during teacher-directed instruction in four out of five baseline sessions, they were excluded from the remainder of the study based on their demonstration of mastery in developing and implementing appropriates rates of OTRs. Teachers who did not demonstrate mastery in implementing appropriate rates of OTRs and acceptable implementation fidelity would receive the multilevel coaching supports.

Multilevel Coaching

The intervention consisted of a data-driven multilevel PD and coaching model (Appendix M), which included targeted and individualized coaching sessions. The interventionist (i.e., instructional coach, Ms. Wilson) conducted some coaching sessions in person and some sessions in virtual (i.e., Google Meet) format with teacher participants individually using GoReact.

Targeted Coaching (Tier 2). The interventionist provided targeted coaching when teacher performance indicated less than 90% of steps were being completed with fidelity or an overall rate of less than or equal to two OTRs per minute during teacher-directed instruction in at least three out of five baseline sessions. Targeted coaching supports included (a) immediate performance feedback in the form of real-time virtual annotations using GoReact following observation sessions, (b) a 10-min weekly or bi-weekly consultation meeting (i.e., every three to four observation sessions), and (c) a follow-up email to the weekly consultation meeting that summarized implementation outcomes and provided teachers with access to a virtual graph of their performance data.

During each observation session for teachers participating in targeted coaching, the interventionist used annotation features in GoReact to provide teachers with (a) a statement of praise associated with the teacher's correct delivery of OTRs, (b) the total count of OTRs, and (c) the overall rate of OTRs during that session. After 3-4 days of instruction, the interventionist met with the teacher using GoReact to discuss the teacher's overall delivery and rate of OTRs. During weekly or bi-weekly consultation sessions, the interventionist targeted specific areas for improvement and provide the teacher with an opportunity to participate in a structured coaching session that had been designed using a Behavior Skills Training (BST; Ward-Horner & Sturmey, 2012) model. BST is an effective method that is commonly used to aid individuals in learning

and acquiring new skills and consists of four components: explicit instruction, modeling, rehearsal, and feedback (Ward-Horner & Sturmey, 2012). When planning for, delivering, and evaluating consultation sessions, the interventionist used the Targeted Coaching Consultation Form (Appendix N) to ensure all coaching procedures (i.e., implementation review, instruction, feedback, goal setting) were included in the session. Finally, following the weekly or bi-weekly virtual consultation sessions, teachers received a follow-up email with a summary of the coaching session and a visual representation (i.e., graph) of their overall performance data.

Teachers entering the coaching phase had demonstrated limited to developing proficiency in their use of OTRs during teacher-directed instruction and needed additional opportunities to receive feedback to assist them in increasing their rate to promote active student engagement and positively affect student behavior. If teachers increased their implementation fidelity at or above 90% and their rate increased to three or more OTRs per minute during teacher-directed instruction for three consecutive sessions, they were moved to the maintenance phase of the study. If teacher performance indicated lower than 80% of steps were being completed with fidelity or a decrease in the rate of OTRs (i.e., fewer than one OTR per minute) occurred during teacher-directed instruction for five consecutive sessions, they then began receiving individualized coaching supports.

Based on observation following coaching sessions, it appeared that teachers participating in targeted coaching often relied on their ability in the moment during teacher-directed instruction to incorporate increased rates of OTRs. However, this strategy appeared to be ineffective in altering and improving teacher behavior based on data. Therefore, it was hypothesized that teachers receiving targeted coaching could potentially benefit from having an opportunity during coaching sessions to explicitly examine upcoming lessons, identify possible

opportunities to embed a variety of OTRs at an increased rate during teacher-directed instruction, and receive specific positive praise or corrective feedback on their integration of OTRs as they aligned to supporting the learning of academic content. The targeted coaching with intentional planning phase was then added based on teacher performance data.

Targeted Coaching with Intentional Planning (Tier 2). The interventionist provided targeted coaching with intentional planning if, while receiving targeted coaching, teacher performance continued to indicate lower than 90% of steps were being completed with fidelity or an overall rate of fewer than two OTRs per min during teacher-directed instruction had occurred for six consecutive sessions. Targeted coaching with intentional planning included (a) immediate performance feedback in the form of real-time virtual annotations using GoReact following observation sessions, (b) a 10-min weekly or bi-weekly virtual consultation meeting (i.e., every three to four observation sessions), (c) an opportunity for the instructional coach to work collaboratively with the teacher in reviewing an upcoming lesson and intentionally planning OTRs to be included during teacher-directed instruction, and (d) a follow-up email to the weekly consultation meeting that summarized implementation outcomes and provided teachers with access to a virtual graph of their performance data.

Consistent with procedures used in targeted coaching, during each observation session for teachers participating in targeted coaching with intentional planning, the interventionist used annotation features in GoReact to provide teachers with (a) a statement of praise associated with the teacher's correct delivery of OTRs, (b) the total count of OTRs, and (c) the overall rate of OTRs during that session. After 3-4 days of instruction, the interventionist met virtually with the teacher using GoReact to discuss the teacher's overall delivery and rate of OTRs. During weekly or bi-weekly virtual consultation sessions, the interventionist targeted specific areas for

improvement and provided the teacher with an opportunity to participate in a structured coaching session again using a BST model (Ward-Horner & Sturmey, 2012). When planning for, delivering, and evaluating consultation sessions, the interventionist used the Targeted Coaching with Intentional Planning Consultation Form (Appendix O) to ensure all coaching procedures (i.e., implementation review, instruction, intentional planning, feedback, goal setting) were included in the session. Finally, following the weekly or bi-weekly virtual consultation sessions, teachers received a follow-up email with a summary of the coaching session and a visual representation (i.e., graph) of their overall performance data.

If teachers increased their implementation fidelity at or above 90% and increased their rate to three or more OTRs per minute during teacher-directed instruction for three consecutive sessions, they moved to the maintenance phase of the study. If teacher performance indicated lower than 80% of steps were being completed with fidelity or a decrease in the rate of OTRs (i.e., fewer than one OTR per minute) during teacher-directed instruction for six consecutive sessions, they then began receiving individualized coaching supports.

Individualized Coaching (Tier 3). Individualized coaching supports were intended to include (a) immediate performance feedback in the form of real-time virtual annotations using GoReact for each observation session, (b) a 3- to 5-min virtual consultation meeting using GoReact following each observation session (i.e., either after the class period or at the end of the day based on teachers' schedule), (c) an email following each consultation summarizing content from the session and providing teachers with access to a graph of their performance data, and (d) a 10-min structured virtual GoReact consultation meeting at the end of every three to four sessions (i.e., weekly or bi-weekly) that used a BST model (Ward-Horner & Sturmey, 2012) to enhance teachers' understanding and demonstration of target skills. Consultation sessions

(including brief 3- to 5-min sessions and weekly/bi-weekly 10-min sessions) were designed to provide teachers with (a) a review of their use of OTRs, (b) an opportunity to receive specific performance feedback, (c) a chance for teachers to practice their use of OTRs, and (d) dedicated time to discuss areas of growth while setting weekly goals. Had teacher participants received individualized coaching, they would have participated in brief and extended consultation sessions using GoReact. During the brief consultation sessions (i.e., 3-5 min, following an observation session), the interventionist would have (a) reviewed the teacher's overall implementation of OTRs; (b) provided specific praise or corrective feedback; (c) identified focus of coaching session (e.g., use of OTRs, delivery skill[s], pacing); (d) provided a description of how OTRs and/or use of the delivery skills help to increase student engagement and decrease disruptive student behaviors; (e) encouraged the teacher to ask any questions; and (f) assisted the teacher in setting a realistic goal for the following session. To ensure coaching procedures were implemented with fidelity, the interventionist would have used the Brief Individualized Coaching Consultation Form (Appendix P) when planning, delivering, and evaluating each brief coaching session.

In addition to participating in brief consultation session, participants receiving individualized coaching would have also received extended weekly/bi-weekly consultation sessions. After 3 to 4 days of instruction, the interventionist would have met with the teacher to discuss the teacher's overall delivery and rate of OTRs. During weekly/bi-weekly virtual consultation sessions, the interventionist would have also identified specific areas for improvement and provided the teacher with an opportunity to participate in a structured coaching session that had been designed based on the principles of BST. When planning for, delivering, and evaluating consultative sessions, the interventionist would have used the Weekly/Extended

Individualized Coaching Consultation Form (Appendix Q) to ensure all coaching procedures (i.e., implementation review, instruction, modeling, rehearsal, feedback, goal setting) were included in the session. Finally, following both the brief and extended consultation sessions, teachers would have received a follow-up email with a summary of the coaching session and a visual representation (i.e., graph) of their overall performance data.

Teachers in this coaching phase would have demonstrated limited proficiency in their use of OTRs during teacher-directed instruction and would have needed additional opportunities to receive feedback to assist them in increasing their rate to promote active student engagement. Teachers had the opportunity to transition to the targeted coaching with intentional planning phase once they had demonstrated an increase in overall implementation between 80%-89% and/or an overall rate of one to two OTRs per min during teacher-directed instruction over the course of three consecutive sessions. Teachers would have entered the maintenance phase had they demonstrated an increase in overall implementation fidelity at or above 90% and a rate of three or more OTRs per minute during teacher-directed instruction over the course of three consecutive sessions. None of the teacher participants received the individualized coaching due to the end of the school year.

Maintenance

Had time allotted in the school year, teachers would have entered the maintenance phase once they had achieved an overall implementation fidelity score at or above 90% and a rate of three or more OTRs per minute during teacher-directed instruction over the course of three consecutive sessions. During the maintenance phase, data would have been collected virtually using GoReact at 2-week, 1-month, and 2-months post-coaching. Coaching and weekly email reminders would have discontinued during the maintenance condition.

Generalization

Teacher implementation fidelity of OTRs and student academic engagement during teacher-directed instruction were observed virtually in an alternate instructional block where teacher-direct instruction still occurred and low levels of student engagement were a concern. Teachers recorded their lesson delivery for generalization data collection virtually using a video recording device and the school's approved video conferencing system (i.e., Google Meet) once at the end of each experimental condition, in an additional class period. If teachers had entered the maintenance phase, generalization data would have been collected once at 1-month post-coaching using the same procedures.

Procedural Reliability

Another approved member of the research team and I gathered procedural reliability data for 55% of the training, data collection, and coaching sessions. Observers used fidelity checklists when observing instructional recordings within GoReact to monitor the implementation of (a) interventionist training and schoolwide PD sessions, (b) data collection, and (c) coaching sessions.

To monitor the implementation of training for the interventionist, another member of the research team used the Instructional Coach Training Session Fidelity Checklist (Appendix R) to collect procedural reliability data. The observer marked either "yes" or "no" on the form to indicate the completion of each of the 10 listed procedural steps. The percent of steps that were followed with fidelity were determined by adding up the number of correctly delivered procedural steps and dividing that number by the number of applicable steps and multiplying that number by 100 (i.e., # of Yes / # of applicable steps x 100).

To collect procedural reliability data of the schoolwide PD session, I used the Coach-led Schoolwide Professional Development Fidelity Checklist (Appendix S) when observing the interventionist during the schoolwide PD. I marked either "yes" or "no" on the form to indicate the completion of each of the 11 listed procedural steps. The percent of steps that were followed with fidelity were determined by adding up the number of correctly delivered procedural steps and dividing that number by the number of applicable steps and multiplying that number by 100 (i.e., # of Yes / # of applicable steps x 100).

In addition, procedural reliability was assessed as it related to data collection. First, an observer used the Experimenter Data Collection Fidelity Checklist (Appendix T) to evaluate if the experimenter provided and collected data using the appropriate forms throughout each condition and phase of the study. Second, I used the Teacher Data Collection Fidelity Checklist (Appendix U) to assess if the teacher supported data collection procedures by recording the required number of instructional lessons and participating in consultation sessions as needed based on previously determined data-decision rules. Third, I used the Instructional Coach Data Collection Fidelity Checklist (Appendix V) to assess the extent to which the interventionist appropriately collected data using the identified forms across each condition and phase of the study. Finally, I collected procedural reliability data for coaching sessions using the Targeted Coaching, Targeted Coaching with Intentional Planning, and Individualized Coaching Fidelity Checklists (Appendices W, X, and Y). The percent of steps that were followed with fidelity were determined by adding up the number of correctly delivered procedural steps and dividing that number by the number of applicable steps and multiplying that number by 100 (i.e., # of Yes / # of applicable steps x 100).

Social Validity

Social validity refers to the perceived usefulness of the intervention and can be measured through goals, procedures, or outcomes (Kennedy, 1992). Social validity was determined in this study based on the outcomes and procedures of the intervention used. To confirm perceptions of feasibility and quality of the multilevel PD and coaching framework and the use of OTRs, participating teachers, students, and the instructional coach completed a social validity questionnaire at the end of the study. The social validity questionnaire – teacher form (Appendix Z), student form (Appendix AA), and instructional coach form (Appendix AB) consisted of items on a 5-point Likert scale (i.e., strongly disagree to strongly agree) addressing participants' perceptions of the usefulness, effectiveness, and feasibility of the intervention (OTRs and coaching supports). The student questionnaire addressed students' perception of the degree to which they observed a change in their teachers' use of OTRs, if the use of OTRs helped them remain engaged during direct instruction, and if they felt they were able to retain content better when increased rates of OTRs were delivered. The teacher and student questionnaires consisted of nine items, whereas the instructional coach questionnaire included 11 items. At the end of each of the social validity forms, participants were asked to complete an open-ended response question that prompted them to provide a brief comment about the usefulness of the intervention and any suggestions pertaining to future implementation.

Data Analysis

I conducted a visual analysis to determine the extent to which a functional relation existed between the independent and dependent variables. Visual analysis includes an examination of a graphic display of data, which is then used to draw conclusions or hypotheses about the relationship or absence of a relationship between control and experimental conditions

(Cooper et al., 2020; Gage & Lewis, 2013; Parsonson & Baer, 1992). In accordance with the

standards set for evaluating the use of single-case research to identify EBPs (Horner et al., 2005;

Kratochwill et al., 2010), I analyzed and interpreted six features of the data including level,

trend, variability, immediacy of effect, proportion of overlapping data, and replication of effect

across conditions and phases (Gage & Lewis, 2013; Kratochwill et al., 2010). There are six

advantages for using visual analysis: (a) visual analysis can quickly provide conclusions and

hypotheses; (b) graphs can be easily made with or without access to technology; (c) graphing can

be displayed in a wide range of formats; (d) graphed data are immediately accessible; (e) graphic

displays of data transform the data as little as possible and provide a true representation of data

measured; and (f) graphs permit researchers access to all of the data, which in turns aids in the

development of judgements concerning patters and distributions of the data that can inform

decisions about the effects of the independent variable on behavior (Gage & Lewis, 2013;

Parsonson & Baer, 1992). In addition to visual analysis, I conducted descriptive analyses

reporting means and ranges for IOA data, procedural reliability data, and social validity data.

To supplement visual analysis for dependent variables, I also calculated effect size

estimates. Specifically, I used Tau-U, a non-parametric method used to determine effect size in

single-case designs, because it allows for the option of controlling undesirable trends in baselines

and allows for the reporting of confidence intervals (Parker et al., 2011). Tau-U has shown to

correspond accurately with visual analysis and to be a more robust measure than other

nonoverlapping effect sizes (i.e., percent of non-overlapping data; Parker et al., 2011). To

calculate Tau-U, I used a free web-based calculator

(http://www.singlecaseresearch.org/calculators/tau-u) to enter data from each baseline and

intervention phase (Vannest et al., 2016). While conducting these calculations, effect sizes were

corrected if baseline trends were undesirable (i.e., a trend in a direction anticipated by the intervention). Vannest and Ninci (2015) suggested the following interpretation guidelines for Tau-U: small behavior change: <0.20; moderate behavior change: 0.20-0.60; large behavior change: 0.60-0.80; and very large behavior change: >0.80. In addition to visual analysis and calculating an estimated effect size, I conducted descriptive analyses reporting means and ranges for IOA data, procedural reliability data, and social validity data

CHAPTER 4: RESULTS

Outcomes of the study are reported in the following sections. Presented first are results for interobserver agreement (IOA) and procedural fidelity, followed by results for each research question. I reported results for research questions 1 and 2 based on visual analysis of graphed data and Tau-U calculation. Tau-U was used to determine changes in percentage of teacher implementation/teachers' delivery rate of OTRs and rate of student engagement between post-PD and targeted coaching phase. It should be noted that Tau-U was not conducted for changes in dependent variables between the two intervention phases (i.e., targeted coaching and targeted coaching with intentional planning) due to not having concurrent data collection across teachers within either phase.

Interobserver Agreement

To measure the extent to which two observers report the same results on the occurrence or nonoccurrence of previously defined behaviors (Gast, 2014), a second observer (i.e., a doctoral candidate) collected IOA data on teacher implementation fidelity and student engagement using permanent product (i.e., video observations recorded using Google Meet on school issued computers) and the Teacher's Implementation of OTR Fidelity Checklist and Student Observation Form (Appendix K). Across all observations, 50% included a second observer to measure IOA with an overall mean of 92.6% agreement across dependent variables (i.e., teacher implementation fidelity and student engagement) and participants.

Teacher Implementation Fidelity

I used the point-to-point method (Ayres & Ledford, 2014) to measure IOA of teacher implementation fidelity. IOA sessions were conducted across teacher participants using direct observation of live recordings taken during teacher-directed instruction. The overall mean IOA

for teacher implementation fidelity was 92.0% (range 80%-100%) across teacher participants and conditions. During baseline (post-PD), IOA was evaluated for 38% of observations and the mean IOA was 93.0% (range 80%-100%). During the targeted coaching phase of the intervention, IOA was assessed for 41.7% of observations and the mean IOA was 94.8% (range 88%-100%). During the targeted coaching with intentional planning phase of the intervention, IOA was assessed for 44.4% with a mean IOA of 87.8% (range 85.7% to 89.0%). Additionally, the mean IOA for the generalization measure of the teacher implementation fidelity was 95.9% with a range from 89% to 100%.

Mr. Sanderson. The IOA data collection for Mr. Sanderson's implementation fidelity occurred during 40% of baseline (post-PD) sessions, 33.3% of targeted coaching sessions, and 42.9% of targeted coaching with intentional planning. The overall mean IOA of teacher implementation fidelity for Mr. Sanderson was 92% (range 81%-100%), with a mean IOA of 94.0% (range 88%-100%) during baseline, 94.0% (range 88%-100%) during targeted coaching, and 88.9% (range 88.8%-89.0%) during targeted coaching with intentional planning. The IOA data collection for Mr. Sanderson occurred during 100% of generalization sessions and the mean IOA was 97.0% with a range from 93.0% to 100%.

Ms. Kent. The IOA data collection for Ms. Kent's implementation fidelity occurred during 37.5% of baseline (post-PD) sessions, 33.3% of targeted coaching sessions, and 50.0% of targeted coaching with intentional planning. There was an overall mean IOA of 94.0% (range 80%-100%) for Ms. Kent's implementation fidelity data, with a mean IOA of 94.3% (range 90%-100%) during baseline, 97.5% (range 95%-100%) during targeted coaching, and 85.7% (no range) during targeted coaching with intentional planning. The IOA data collection for Ms. Kent

occurred during 100% of generalization sessions and the mean IOA was 94.0% (range 89.0%-96.7%).

Student Engagement

I also used the point-to-point method (Ayres & Ledford, 2014) to measure IOA of student engagement. IOA sessions were conducted across student participants using direct observation of live recordings taken during teacher-directed instruction. Results indicated an overall mean IOA of 95.4% (range 95.0%-95.9%) for student engagement across student participants and conditions. During baseline (post-PD), IOA was assessed for 50% of observations and all sessions yielded 100% agreement. During the targeted coaching phase of the intervention, IOA for student engagement was assessed for 33.3% of sessions, with a mean IOA of 91.8% (range 89%- 100%). During the targeted coaching with intentional planning phase of the intervention, IOA was evaluated for 33.3% of sessions, with a mean IOA of 93.2% (range 85.7%-100%).

Abigail and Max. IOA of student engagement for Abigail and Max (students in Mr. Sanderson's class) was evaluated during 40.0% of baseline sessions, 33.3% of targeted coaching sessions, and 42.9% of targeted coaching with intentional planning. The overall mean IOA of student engagement for Abigail and Max was 95.9% (range 90%-100%), with a range from 90% to 100%. During baseline, IOA rates for these students were assessed during 2 of 5 (40%) of observations with a mean IOA of 100% during baseline, 94.3% (range 83%-100%) during targeted coaching, and 97.0% (range 94%-100%) during the targeted coaching with intentional planning phase of the intervention.

Piper and Kade. IOA of student engagement for Piper and Kade (students in Ms. Kent's class) was evaluated during 37.5% of baseline sessions, 33.3% of targeted coaching sessions, and 50.0% of targeted coaching with intentional planning. Overall, the mean IOA of student

engagement for Piper and Kade was 95.0% with a range from 89.0% to 100%. The mean IOA was 100% during baseline, 93.0% (range 89.0%-100%) during targeted coaching, and 100% during targeted coaching with intentional planning.

Procedural Fidelity

A second observer and I assessed procedural fidelity to verify the degree to which the intervention framework was implemented as designed. Procedural fidelity data were collected for 100% of the training, data collection, and coaching sessions. Observers used fidelity checklists when observing instructional recordings to monitor the implementation of interventionist training, schoolwide PD sessions, data collection, and coaching sessions.

A second observer used the Instructional Coach Training Session Fidelity Checklist (Appendix R) to monitor and collect procedural fidelity data during training for the interventionist. Results indicated 100% of steps were completed with fidelity. Additionally, I collected the procedural fidelity data during the interventionist-delivered schoolwide PD session using the Coach-led Schoolwide Professional Development Fidelity Checklist (Appendix S). Results also indicated 100% of steps were completed with fidelity.

During data collection, procedural fidelity was assessed throughout each condition and phase of the study. First, a second observer used the Experimenter Data Collection Fidelity Checklist (Appendix T) to evaluate the extent to which the experimenter provided and collected data using the appropriate forms. Results indicated the experimenter completed 100% of steps. Second, I used the Teacher Data Collection Fidelity Checklist (Appendix U) to evaluate teachers' completion of data collection procedures and participation in consultation sessions based on established data-decision rules. Results indicated teachers participated in 100% of training sessions related to data collection procedures and participation in consultations sessions

based on teacher performance data. Third, I used the Instructional Coach Data Collection Fidelity Checklist (Appendix V) to assess the extent to which the interventionist appropriately provided and collected data throughout the study. Results indicated the instructional coach (i.e., Ms. Wilson) completed 86% of steps when providing and collecting data across each condition and phase of the study. Finally, I used the Targeted Coaching and Targeted Coaching with Intentional Planning Fidelity Checklists (Appendices W and X) to measure procedural fidelity of the interventionist's/coach's coaching behavior. Results indicated Ms. Wilson completed 90.0% (36 of 40) of steps during the targeted coaching phase and 90.9% (30 of 33) during the targeted with intentional planning phase.

Results for Research Question 1: What are the effects of post-PD multilevel coaching provided by a school-based coach on high school teachers' implementation fidelity of OTRs within daily teacher-directed instruction?

Teacher implementation fidelity data were reported and examined in two ways: (a) based on the total number of required procedural components (i.e., including the required, acceptable rate of OTRs) and (b) according to the actual number of procedural components each teacher completed correctly. Data were examined in this manner, first to determine if teachers were able to demonstrate and achieve the required procedural components and delivery rate suggested by previous research and to then assess the extent to which teachers were able to implement procedural components when delivering OTRs. During baseline (post-PD) when examining teachers' implementation fidelity of OTRs within daily teacher-directed instruction, data based on the total number of required procedural components showed that teachers had an overall mean of 13.1% with a range from 5.0% to 32.0%. During the targeted coaching phase of the intervention, teachers' implementation fidelity of required procedural components increased by

15%, with an overall mean of 28.1% (range 12.5%-47.0%). During the targeted coaching with intentional planning phase of the intervention, implementation fidelity of required procedural components decreased by 11.3%, with an overall mean of 16.8% (range 11.0 %-27.0%). The Tau-U score for change in percentage of teacher implementation fidelity from post-PD to the targeted coaching intervention phase when examining the total number of required procedural components was very large (0.8462, p <.05, 90% CI = [0.458, 1.00]). In Figure 2, the data points with closed circles show teachers' implementation fidelity of OTRs within daily teacher-directed instruction, based on the total number of required procedural components.

As an element of required procedural components, rate of OTRs was calculated as a part of implementation fidelity. During post-PD, teachers' delivery rate of OTRs remained well below the desired rate of 3 OTRs per minute (M = 0.51 OTRs per minute, range = 0.60-1.28 OTRs per minute), suggested by MacSuga-Gage and Simonsen (2015). For example, Mr. Sanderson's delivery rate of OTRs across the five post-PD sessions was no more than 0.6 OTR per minute. As with teacher implementation fidelity, there was a slight increase in the level of teachers' delivery rate for both teacher participants after receiving the intervention. This increase was most evident during the targeted coaching phase of the intervention (M = 1.08 OTRs per minute, range = 0.33-1.50 OTRs per minute) with a mean increase of 0.36 OTRs per minute for Mr. Sanderson and 0.69 OTRs per minute for Ms. Kent when compared to their performance during the post-PD condition. Mr. Sanderson continued to increase his OTR delivery rate to 0.81 during the targeted coaching with intentional planning (i.e., a mean increase of 0.09 over his performance during targeted coaching), whereas Ms. Kent decreased her mean OTR delivery rate from 1.30 during targeted coaching to 0.80 during targeted coaching with intentional planning. The Tau-U score for change in teachers' delivery rate of OTRs from post-PD to the targeted

coaching intervention phase was large (0.6987, *p* <.05, 90% CI = [0.311, 1.00]). In Figure 3, data in grey bars show teachers' delivery rates of OTRs within daily teacher-directed instruction.

During post-PD when examining teachers' implementation fidelity of OTRs according to the actual number of required procedural components completed, data showed that teachers had an overall mean of 54.7% with a range from 50.0% to 80.0%. During the targeted coaching phase of the intervention, teachers' implementation fidelity of actual procedural components completed increased by 23.4%, with an overall mean of 78.1% (range 58.0%-93.0%). During the targeted coaching with intentional planning phase of the intervention, implementation fidelity of required procedural components decreased by 24.4%, with an overall mean of 53.7% (range 33.0 %-66.0%). The Tau-U score for change in percentage of teacher implementation fidelity from post-PD to the targeted coaching intervention phase when examining the actual number of required procedural components was large (0.7885, *p* <.05, 90% CI = [0.401, 1.00]). In Figure 2, the data points with open circles show teachers' implementation fidelity of OTRs within daily teacher-directed instruction based on the actual number of completed procedural components.

Figure 2

Percentage of Teacher Implementation Fidelity
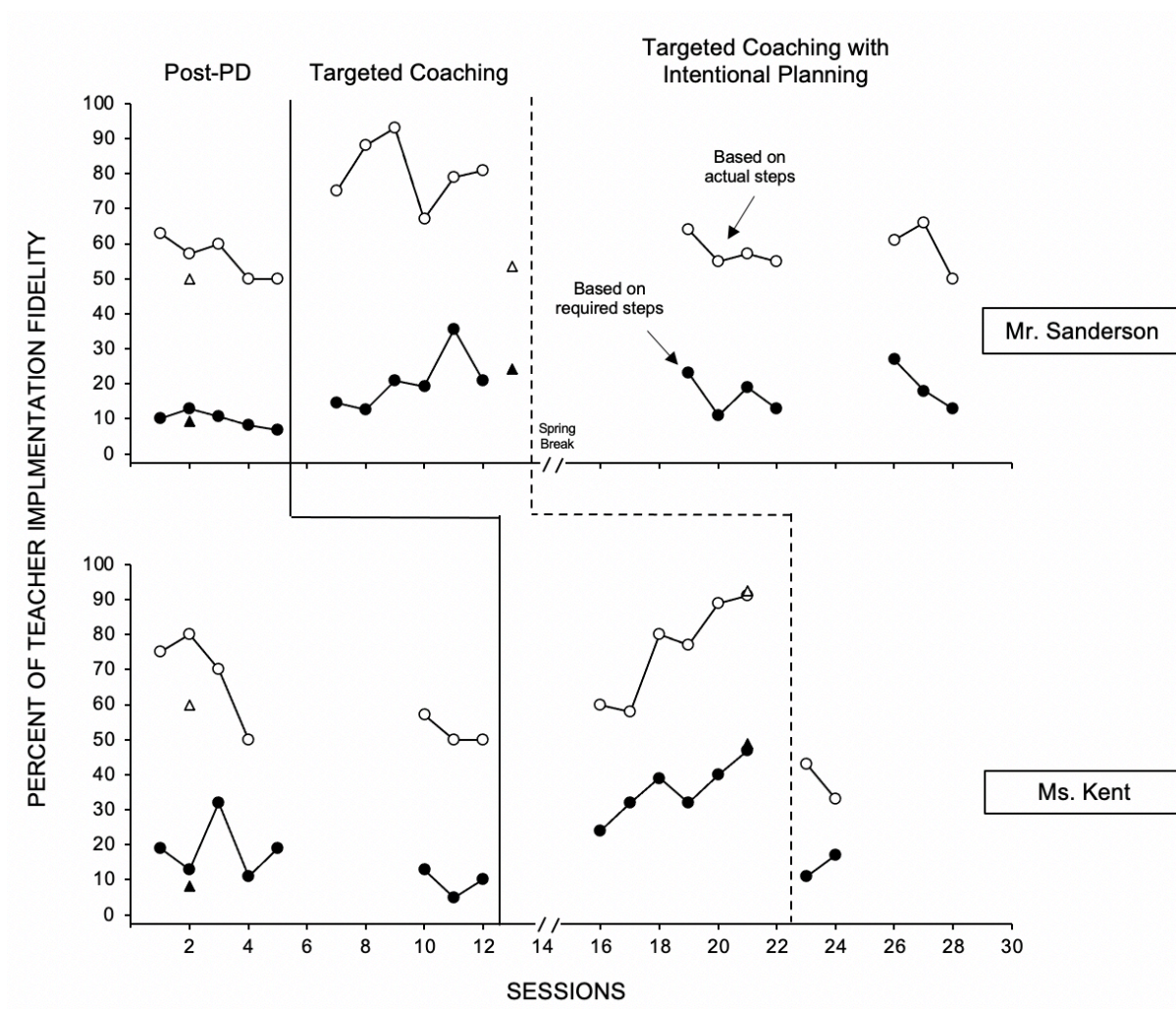
Note: The closed circles (based on required procedural components) and open circles (based on actual procedural steps) represent data in the participant's primary instructional setting. The closed triangles (based on required procedural components) and open triangles (based on actual procedural steps) represent data in the participant's generalization setting.

Mr. Sanderson

During post-PD, Mr. Sanderson's implementation fidelity of OTRs during teacher-directed instruction based on required procedural components (i.e., closed circles in Figure 2) remained low and fairly stable ($M = 9.7\%$, range = 6.8%-12.9%). After receiving an initial

targeted coaching session, there was an immediate change in level of implementation from post-PD to the targeted coaching intervention phase, with an overall increasing trend and moderate variability ($M = 20.6\%$, range = 12.5%-35.5%). Mr. Sanderson participated in two targeted coaching sessions but was unable to achieve the pre-determined performance criterion for remaining in the current phase or transitioning to the maintenance phase. Upon entering the targeted coaching with intentional planning phase of the study, level of implementation fidelity remained low with a slightly decreased level of performance and some variability ($M = 17.73\%$, range = 11.29%-27.41%) with no demonstration of a consistent trend. The Tau-U score for change in Mr. Sanderson's percentage of teacher implementation fidelity from post-PD to the targeted coaching intervention when examining the total number of required procedural components was very large (1.0, $p <.05$, 90% CI = [0.399, 1.00]). Additionally, Mr. Sanderson was able to demonstrate an immediate change in level from post-PD to intervention (i.e., from 9.4% to 24.2%) when generalizing implementation to a similar instructional block (i.e., closed triangles in Figure 2).

Additionally, data during post-PD showed that Mr. Sanderson delivery rate of OTRs (i.e., grey bars in Figure 3) remained low and fairly stable ($M = 0.42$ OTRs per minute, range = 0.29-0.60 OTRs per min) with a decreasing trend. After receiving coaching, there was an increase in level of rate of OTRs from post-PD to the targeted coaching intervention phase, with an overall increasing trend and moderate variability ($M = 0.72$ OTRs per minute, range = 0.33-1.30 OTRs per minute). During the targeted coaching phase, Mr. Sanderson was unable to achieve the pre-determined performance criterion for remaining in the current phase or transitioning to the maintenance phase. Upon entering the targeted coaching with intentional planning phase of the study, OTR delivery rates remained low with a slightly increased level of performance and some

variability (M = 0.81 OTRs per minute, range = 0.4-1.2 OTRs per minute) with no demonstration of a consistent trend. The Tau-U score for change in Mr. Sanderson's delivery rate of OTRs from post-PD to the targeted coaching intervention was large (0.6667, p = 0.0679, 90% CI = [0.066, 1.00]). Additionally, Mr. Sanderson was able to demonstrate an immediate change in delivery rate of OTRs from post-PD to intervention (i.e., from 0.2 OTRs per minute to 1.3 OTRs per minute) in the generalization setting.

When examining Mr. Sanderson's implementation fidelity of OTRs during teacher-directed instruction according to the actual number of procedural components completed correctly (i.e., open circles in Figure 2), data showed his post-PD performance was at the moderate level with stability (M = 56.0%, range = 50.0%-63.9%) and an overall decreasing trend. After receiving the targeted coaching supports, there was an immediate change in level of implementation from post-PD to intervention with moderate variability (M = 80.5%, range = 67%-93%) and no clear increase or decrease in trend. Mr. Sanderson participated in two targeted coaching sessions but was unable to achieve the pre-determined performance criterion for remaining in the current phase or transitioning to the maintenance phase. Upon entering the targeted coaching with intentional planning phase of the study, there was a decrease in the level of implementation fidelity to the level similar to that of post-PD (M = 60.3%, range = 50.0%-70.0%). The Tau-U score for change in Mr. Sanderson's percentage of teacher implementation fidelity from post-PD to the targeted coaching intervention phase when examining the actual number of procedural components completed correctly was very large (1.0, p <.05, 90% CI = [0.399, 1.00]). Finally, the generalization data showed that Mr. Sanderson's implementation fidelity changed very minimally from post-PD (50.0%) to intervention (53.5%) when examining the actual number of procedural components (i.e., open triangles in Figure 2).

Ms. Kent

During post-PD, Ms. Kent's implementation fidelity of OTRs during teacher-directed instruction based on required procedural components (i.e., closed circles in Figure 2) remained low and moderately variable (M = 13.8%, range = 4.8%-32.0%) with an overall slight decreasing trend. During the targeted coaching phase, there was an immediate change in level of implementation fidelity with a steady increasing trend (M = 35.5%, range = 24.2%-46.8%). Ms. Kent participated in two targeted coaching sessions but was unable to achieve the pre-determined performance criterion for remaining in the current phase or transitioning to the maintenance phase. Upon entering the targeted coaching with intentional planning phase of the study, level of implementation fidelity decreased to the post-PD level with no variability (M = 14.0%, range = 11.3%-16.7%). The Tau-U score for change in Ms. Kent's percentage of teacher implementation fidelity from post-PD to the targeted coaching phase when examining the total number of required procedural components was very large (0.9167, p <.05, 90% CI = [0.386, 1.00]). Ms. Kent's generalization data showed that she demonstrated an immediate change in level from post-PD (8.1%) to intervention (46.8%) when generalizing implementation to a similar instructional block (i.e., closed triangles in Figure 2).

In addition, data during post-PD showed that Ms. Kent's delivery rate of OTRs (i.e., grey bars in Figure 3) remained low and moderately variable (M = 0.61 OTRs per minute, range = 0.20-1.28 OTRs per min) with no demonstration of a consistent trend. After receiving coaching, there was a consistent increase in level of rate of OTRs from post-PD to the targeted coaching intervention phase, with minimal variability (M = 1.30 OTRs per minute, range = 1.10-1.50 OTRs per minute). During the targeted coaching phase, Ms. Kent was unable to achieve the pre-determined performance criterion for remaining in the current phase or transitioning to the

maintenance phase. Upon entering the targeted coaching with intentional planning phase of the study, OTR delivery rates dropped with a potentially increasing trend across the two data points ($M = 0.80$ OTRs per minute, range $= 0.60$-1.00 OTRs per minute). The Tau-U score for change in Ms. Kent's delivery rate of OTRs from post-PD to the targeted coaching intervention was very large (0.9167, $p < 0.5$, 90% CI $= [0.386, 1.00]$). When examining data in the generalization setting, results showed that Ms. Kent was able to demonstrate an immediate change in level from post-PD to intervention (i.e., from 0.60 OTRs per minute to 1.5 OTRs per minute).

When examining Ms. Kent's implementation fidelity of OTRs during teacher-directed instruction according to the actual number of procedural components completed correctly (i.e., open circles in Figure 2), data showed that she demonstrated a moderate level of implementation fidelity initially with an overall decreasing trend and her performance stabilized ($M = 59.4\%$, range $= 42.9\%$-80.0%). During the targeted coaching phase, there was an immediate change in level of implementation from post-PD to intervention, with a steady increasing trend ($M = 75.7\%$, range $= 57.6\%$-90.6%). Ms. Kent participated in two targeted coaching sessions but was unable to achieve the pre-determined performance criterion for remaining in the current phase or transitioning to the maintenance phase. Upon entering the targeted coaching with intentional planning phase of the study, there was an immediate and substantial decrease in the level of implementation fidelity that was below her post-PD performance level ($M = 41.5\%$, range $= 33.0\%$-50.0%). The Tau-U score for change in Ms. Kent's percentage of teacher implementation fidelity from post-PD to the targeted coaching phase when examining the actual number of procedural components completed correctly was large (0.6875, $p < .05$, 90% CI $= [0.157, 1.00]$). Finally, Ms. Kent was able to demonstrate an immediate change in level from post-PD (60.0%)

to intervention (90.6%) when generalizing implementation to a similar instructional block (i.e., open triangles in Figure 2).

Results for Research Question 2: To what degree does post-PD multilevel coaching provided by a school-based coach that is intended to promote teachers' implementation of OTRs increase active student engagement for high school students?

When examining students' rate of academic engagement when presented with OTRs during teacher-directed instruction, students demonstrated an overall mean rate of engaging in 0.35 OTRs per minute (range 0-1.40) across students and conditions, in relevance to the overall mean teachers' delivery rate of 0.77 OTRs per minute (range 0.20-1.50). The Tau-U score for change in students' academic engagement from post-PD to the targeted coaching phase was very large (0.8237, p <.05, 90% CI = [0.552, 1.00]). See Figure 3 for students' rate of academic engagement when presented with OTRs during teacher-directed instruction, in relation to teachers' delivery rate of OTRs.

Figure 3

Teachers' Delivery Rate of OTRs and Students' Rate of Academic Engagement
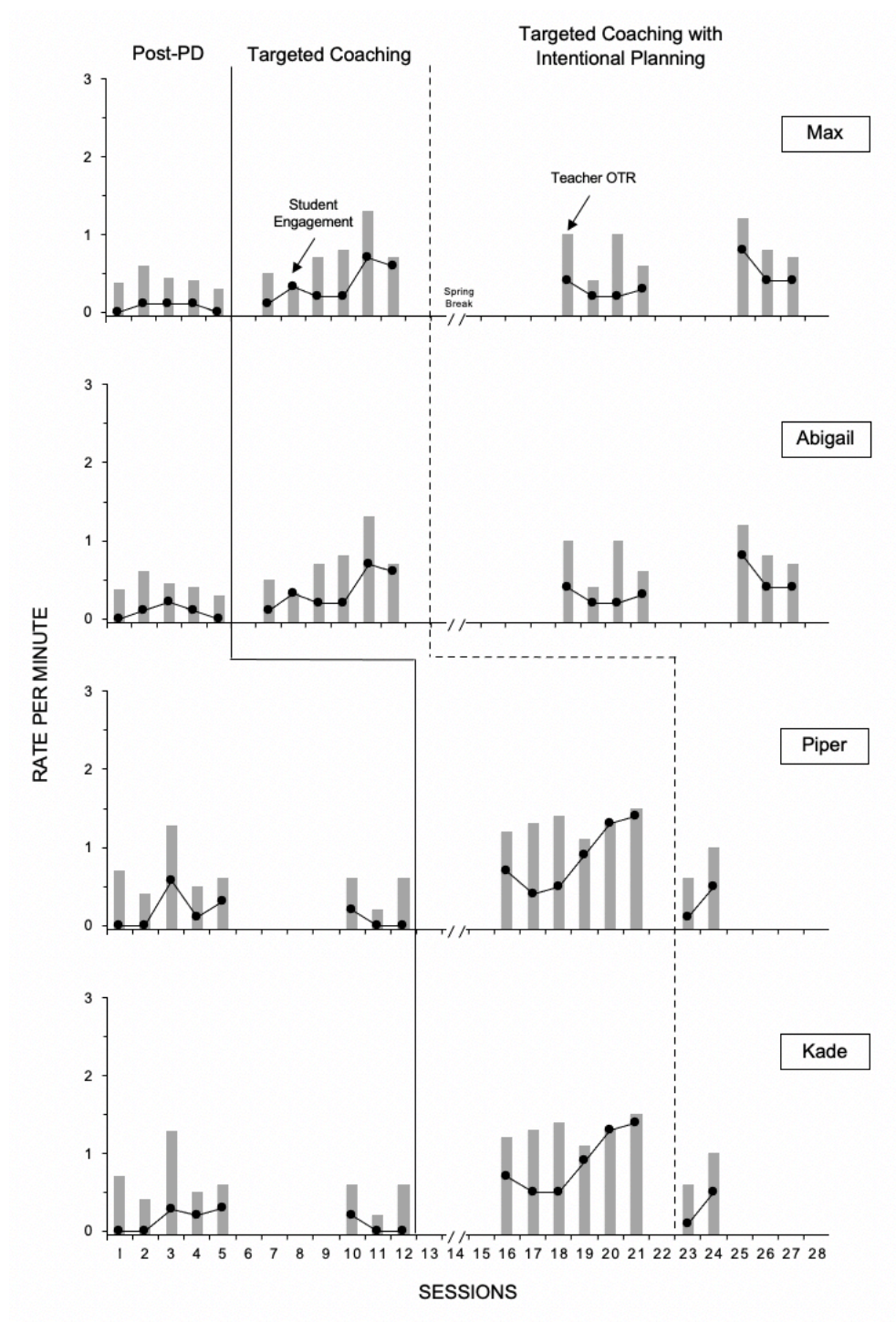
Note. The data in grey bars represent teachers' delivery rate of OTRs. The data in closed circles represent students' academic engagement rate.

Max and Abigail

During post-PD, both Max's and Abigail's student engagement rates demonstrated low stable levels with limited to no variability ($M = 0.07$, range = 0-0.22). After their teacher, Mr. Sanderson, participated in an initial targeted coaching session, there was a change in level in both students' engagement rates. Although student rates remained low, data indicated an increasing trend with some variability ($M = 0.35$, range = 0.20-0.70) for both students. Once Mr. Sanderson entered the targeted coaching with intentional planning phase of the study, both Max and Abigail demonstrated a very slight overall increase in level of student engagement with some variability ($M = 0.38$, range = 0.20-0.80). Interestingly, Max's and Abigail's engagement rates were almost identical across the phases. The Tau-U score for change in students' academic engagement for Max and Abigail from post-PD to the targeted coaching phase was large (0.8000, $p < .05$, 90% CI = [0.384, 1.00]). Individually, the Tau-U score for change in Max's academic engagement from post-PD to the targeted coaching phase was very large (0.8667, $p < .05$, 90% CI = [0.266, 1.00]). For Abigail, the Tau-U score for change in her academic engagement from post-PD to the targeted coaching phase was large (0.7333, $p < .05$, 90% CI = [0.133, 1.00]).

Piper and Kade

During post-PD, both Piper's and Kade's student engagement rates demonstrated low stable levels with an initial increasing trend that stabilized over the last three data points ($M = 0.13$, range = 0-0.30). Following Ms. Kent's participation in an initial targeted coaching session, there was an immediate change in level in both students' engagement rates. Although student academic engagement rates remained low, there was an overall increasing trend for both students ($M = 0.87$, range = 0.40-1.40). Once Ms. Kent entered the targeted coaching with intentional planning phase of the study, both Piper and Kade demonstrated a decrease in level of student

engagement (M = 0.30, range = 0.10-0.50) and a possible increasing trend. Like Max and

Abigail, Piper's and Kade's engagement rates were highly similar across the phases. The Tau-U

score for change in students' academic engagement for Piper and Kade from post-PD to the

targeted coaching phase was very large (0.9583, p <.05, 90% CI = [0.589, 1.00]). Individually,

the Tau-U score for change in Piper's academic engagement from post-PD to the targeted

coaching phase was very large (0.9167, p <.05, 90% CI = [0.386, 1.00]). For Kade, the Tau-U

score for change in academic engagement from post-PD to the targeted coaching phase was also

very large (1.0, p <.05, 90% CI = [0.469, 1.0]).

Results for Research Question 3: What are the perceptions of the instructional coach on the

importance, acceptance, and effectiveness of multilevel PD and coaching in supporting high

school teachers' implementation of OTRs and in increasing students' active engagement?

At the end of the study, Ms. Wilson, the school's instructional coach indicated her

perceptions about the importance, acceptability, and effectiveness of multilevel PD and coaching

in supporting high school teachers' implementation of OTRs and in increasing students' active

engagement. Ms. Wilson responded to an electronic social validity questionnaire in Google

Form. This questionnaire included 10 Likert scale questions on a scale of 1 to 5 (i.e., 1= strongly

disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree) and one open response

question requesting a brief comment pertaining to the usefulness of the intervention and any

suggestions for future implementation. See Table 1 for results of Ms. Wilson's perceptions. Ms.

Wilson agreed that she felt well prepared in her role as an instructional coach within the project

to support teachers' use of high rates of OTRs. She also reported that she agreed it was relatively

easy to virtually collect data on teachers' implementation fidelity of OTRs and student

engagement. Furthermore, Ms. Wilson agreed that she observed an increase in active student

engagement in the classrooms she supported during the study once teachers began implementing higher rates of OTRs. Ms. Wilson reported neutral perceptions pertaining to observed decreases in student behavior after teachers began implanting higher rates of OTRs and in her recommendation of this strategy to teachers who experience classroom management difficulties during direct instruction. As the school's instructional coach, Ms. Wilson also reported neutral perceptions related to worth and effort of providing tiered coaching to support teachers' implementation of increased rates of OTRs and her beliefs regarding the use of a tiered coaching framework and its benefit in supporting teachers in achieving the goal of increasing their use of OTRs during daily teacher-directed instruction. Finally, Ms. Wilson indicated neutral perceptions pertaining to the potential negative impact participating in the tiered coaching framework had on her ability to complete other job-related responsibilities and if she would recommend this coaching framework to administrators as an efficient, effective, and sustainable way to provide teachers with feedback and training related to other classroom management practices in the future. In the open response field, Ms. Wilson shared that overall, she believes the tiered coaching framework had a positive outcome on student engagement, but that she feels as though the timing of the intervention made it difficult for teachers to participate with fidelity. In her response, she noted that she would have preferred to have received this opportunity and for her staff to have participated in training in the fall rather than in the spring. She believes that in the spring, teachers began to feel overwhelmed by the end of the study and that other school-based factors had a direct negative impact on outcomes associated with the study.

Table 1

Instructional Coach's Perceptions of the Intervention

Questions	Rating
1. I felt prepared in my role as a coach to support teachers in using high rates of opportunities to respond as an effective classroom management practice.	4
2. It was relatively easy to virtually collect data on teachers' use of opportunities to respond using GoReact.	4
3. It was relatively easy to virtually collect data on student engagement using GoReact.	4
4. I have observed a decrease in problem behaviors in the classrooms I support since teachers began implementing higher rates of opportunities to respond.	3
5. I have observed an increase in active student engagement (i.e., student participation) in the classrooms I support since teachers began implementing higher rates of opportunities to respond.	4
6. I would recommend the strategy of high rates of opportunities to respond to any teacher who is experiencing classroom management difficulties during direct instruction.	3
7. Providing tiered coaching support to teachers on high rates of opportunities to respond was worth the effort required.	3
8. The tiered coaching model was beneficial in achieving the goal of increasing teachers' use of opportunities to respond during teacher-directed instruction.	3
9. The tiered coaching model was beneficial and did not inconvenience me or negatively impact my ability to complete other job-related responsibilities.	3
10. I would recommend this coaching model to administrators to provide feedback and training on classroom management practices in the future.	3

Note: Based on a 5-point Likert scale. 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

Results for Research Question 4: What are the perceptions of teachers on the importance, acceptance, and effectiveness of multilevel PD and coaching in supporting their implementation of OTRs and the effects of OTRs on active student engagement of high school students?

Following their participation in the intervention, teachers (i.e., Mr. Sanderson and Ms. Kent) indicated their perceptions pertaining to the importance, acceptability, and effectiveness of multilevel PD and coaching in supporting their implementation of OTRs and in increasing students' active engagement. Teachers responded to an electronic social validity questionnaire in Google Form. This questionnaire included eight Likert scale questions on a scale of 1 to 5 (i.e., 1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree) and one open response question requesting a brief comment pertaining to the usefulness of the intervention and any suggestions for future implementation. See Table 2 for results of teachers' perceptions. Mr. Sanderson and Ms. Kent both agreed they observed an increase in active student engagement after implementing higher rates of OTRs during teacher-directed instruction. Additionally, Ms. Kent reported she strongly agreed she would recommend using increased rates of OTRs to any teacher who is experiencing difficulties in classroom management during periods of teacher-directed instruction, whereas Mr. Sanderson reported neutral perceptions regarding his recommendation. Furthermore, teachers either agreed or reported neutral perceptions related to the ease of implementing increased rates of a variety of OTRs during teacher-directed instruction, that incorporating high rates of OTRs was worth the effort, and the tiered coaching framework helped them achieve their daily/weekly of increasing their delivery of OTRs. Both teachers also indicated neutral perceptions pertaining to observed differences in students' problem behaviors since implementing higher rates of OTRs. Finally, Ms. Kent, who strongly

agreed, and Mr. Sanderson, who disagreed, reported contrasting perceptions related to the

coaching framework's ability to assist them in implementing increased rates of OTRs without

negatively impacting other job-related responsibilities and their future recommendation to

administrators regarding the use of this coaching framework as an efficient, effective, and

sustainable way to provide teachers with feedback and training related to other classroom

management practices. Ms. Kent noted in the open response box that while participating in the

intervention, it was helpful to receive specific feedback regarding teacher implementation

fidelity and to see how students were engaging in presented OTRs. Conversely, Mr. Sanderson

indicated that even though he believes increasing student response rates during lessons is a "great

idea," he felt as though expectations pertaining to the desired delivery rates of OTRs were too

high. Mr. Sanderson also noted he feels as though increasing the delivery of OTRs can be a good

strategy for incorporating lower levels of critical questioning, but he believes instructional time

should include more opportunities for students to engage in critical thinking rather than

"responding every 20 seconds."

Table 2

Teachers' Perceptions of the Intervention

	Teacher Ratings		
Questions	Mr. Sanderson	Ms. Kent	Mean
1. I have observed a decrease in student problem behaviors since implementing higher rates of opportunities to respond.	3	3	3.0
2. I have observed an increase in active student engagement (i.e., student participation) since implementing higher rates of opportunities to respond.	4	4	4.0
3. It was relatively easy to implement a variety of opportunities to respond at a high rate.	3	4	3.5
4. I would recommend using high rates of opportunities to respond to any teacher who is experiencing classroom management difficulties during direct instruction.	3	5	4.0
5. Incorporating high rates of opportunities to respond was worth the effort required.	3	4	3.5
6. The virtual coaching model helped me implement high rates of varied opportunities to respond but did not inconvenience me or negatively impact my ability to complete other job-related responsibilities.	2	5	3.5
7. The virtual coaching model helped me achieve my daily/weekly goal of implementing high rates of opportunities to respond.	3	4	3.5
8. I would recommend this virtual coaching model to administrators to provide feedback and training on classroom management practices in the future.	2	5	3.5

Note: Based on a 5-point Likert scale. 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree,

5 = strongly agree

Results for Research Question 5: What are the perceptions of high school students on the usefulness and effectiveness of teachers' implementation of OTRs during teacher-directed instruction?

At the conclusion of the study, student participants (i.e., Max, Abigail, Piper, and Kade) indicated their perceptions pertaining to the usefulness and effectiveness of multilevel PD and coaching in supporting their teachers' implementation of OTRs and in increasing their own active engagement. Student participants responded to an electronic social validity questionnaire in Google Form. This questionnaire included eight Likert scale questions on a scale of 1 to 5 (i.e., 1= strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, and 5 = strongly agree) and one open response question requesting a brief comment about the usefulness of OTRs and any suggestions for future implementation of this strategy. See Table 3 for results of student perceptions. Overall, students indicated positive perceptions (i.e., agree or strongly agree) related to their observations of their teachers' increased use of a variety of OTRs and increases in their own classroom participation because of their teacher implementing higher rates of OTRs during teacher-directed instruction. Additionally, students indicated they either agreed or strongly agreed with feeling safe to participate in class when their teacher used a variety of OTRs, that having a variety of OTRs helped them better understand or retain content information during teacher-directed instruction, and that increased rates of OTRs helped students achieve their goal of participating more in class. Furthermore, when asked if students enjoyed participating in class more when their teacher used a variety of OTRs, two of four students (i.e., Abigail and Kade) strongly agreed, whereas the other two students (i.e., Piper and Max) provided a neutral rating. When asked about their perceptions related to the ease to which students were able to participate in class when teachers incorporate a variety of OTRs at high rates, two of four students (i.e., Max

and Piper) reported feeling neutral, where as one (i.e., Abigail) strongly agreed and one (i.e., Kade) agreed. Finally, when prompted to consider if they would recommend other teachers use a variety of OTRs in their class, two students (i.e., Abigail and Kade) strongly agreed, one student agreed (i.e., Piper), and one student (i.e., Max) indicated perceptions of neutrality. According to students' open response comments, Abigail indicated that when her teacher, Mr. Sanderson, used increased rates of OTRs it increased her interest in academic content and provided her with safe and predictable ways to engage in learning and receive feedback based on her current level of understanding. Kade also commented that when Ms. Kent used increased rates of OTRs, it provided an inclusive and equal opportunity for all students to respond to questions. Conversely, Max indicated that he did not feel as though he experienced a direct effect in how he learned because of his teacher's increase in delivery of OTRs.

Table 3

Student Perceptions of the Intervention

	Student Ratings				
Questions	Max	Abigail	Piper	Kade	Mean
1. I have observed an increase in my teacher's use of a variety of opportunities to respond.	4	5	4	5	4.5
2. I have observed an increase in my classroom participation since my teacher has been implementing higher rates of opportunities to respond.	4	5	5	5	4.8
3. It is relatively easy to participate when my teacher uses a variety of opportunities to respond at a high rate.	3	5	3	4	3.8
4. I feel safe to participate when my teacher uses a variety of opportunities to respond.	5	5	4	5	4.8
5. I enjoy participating in class more when my teacher uses a variety of opportunities to respond.	3	5	3	5	4.0
6. Having a variety of opportunities to respond helps me better understand or retain content information from class.	4	5	4	5	4.5
7. When my teacher uses high rates of opportunities to respond, it helps me achieve my goal of participating more in class.	3	5	5	5	4.5
8. I would recommend that other teachers use a variety of opportunities to respond in their class.	3	5	4	5	4.3

Note: Based on a 5-point Likert scale. 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree

CHAPTER 5: DISCUSSION

The purpose of this study was to investigate the effects of multilevel training and coaching support provided by a school-based coach on high school teachers' use of a trained classroom management skill (i.e., opportunities to respond [OTRs]) during daily instruction. More specifically, the present study evaluated the effects of schoolwide PD combined with targeted or individualized coaching support on teachers' implementation fidelity of OTR within daily teacher-directed instruction and teachers' implementation of OTRs on active student engagement for high school students. I used a multiple baseline across teacher participants design (Cooper et al., 2020; Ledford & Gast, 2018; What Works Clearinghouse, 2020) to evaluate the effects of multilevel training and coaching support on teachers' implementation fidelity and student engagement. Results indicated the two teacher participants improved implementation fidelity with post-PD coaching support but failed to achieve the required rates of OTRs. Additionally, when teachers improved implementation fidelity, students also demonstrated an increase in academic engagement. The coaching had an initial effect on teachers' generalization of OTRs in a secondary instructional block. Social validity data indicated teachers and the school's instructional coach rated the multilevel PD and coaching framework to be moderately effective in supporting teachers' implementation of high rates of OTRs. Student participants reported observed increases in teachers' use of a variety of OTRs, positive feelings associated with actively participating in class when presented with increased OTRs, and a better understanding or retention of course content when teachers used high rates of OTRs. All participants also indicated they observed improvements in students' academic

engagement during teachers' delivery of increased rates of OTRs. Results of the study are discussed further in this chapter, organized by the six research questions.

Research Question 1: What are the effects of post-PD multilevel coaching provided by a school-based coach on high school teachers' implementation fidelity of OTRs within daily teacher-directed instruction?

Teacher Implementation Fidelity

Visual analysis of results indicated post-PD multilevel coaching provided by a school-based coach helped to minimally improve teachers' implementation fidelity of OTRs within daily teacher-directed instruction. Specifically, Mr. Sanderson and Ms. Kent received targeted coaching with improved implementation fidelity across six observational sessions. However, both teachers failed to achieve the required rates (i.e., ≥3 OTRs per minute) of OTRs. When examining teachers' implementation fidelity of OTRs based on the total number of required procedural components, teachers had an overall mean of 19.2% (range 4.8%-46.8%) across the experimental conditions. During baseline (i.e., post-PD), teachers' level of implementation fidelity of required procedural components remained low (M = 11.8%, range = 4.8%-19.0%). There was an immediate effect demonstrating a steady increase in teacher implementation fidelity of required procedural components for both teacher participants after receiving targeted coaching (M = 28.0%, range = 12.5%-46.8%). During this phase, data suggest that when teachers consistently participated in data collection procedures, coaching sessions, and data analysis, their implementation fidelity improved. Because both teachers failed to achieve the desired level of implementation fidelity (i.e., 90%) with fewer than a rate of 2 OTRs, they received the targeted coaching with intentional planning. When teachers transitioned to receiving targeted coaching with intentional planning, there was an immediate decrease in teacher implementation fidelity (M

= 15.9%, range= 11.3%-27.4%) with Ms. Kent dropping the implementation fidelity below her post-PD level. Due to the end of school year, Mr. Sanderson did not receive a more intensive, individualized coaching after not meeting criterion for ending targeted coaching with intentional planning. The Tau-U scores for teacher implementation fidelity of required procedural components ranged from 0.91 to 0.93, with a very large behavior change occurring between post-PD and the targeted coaching phase of the intervention. These effect size estimates support the interpretation of visual analysis and the initial effectiveness of the intervention, specifically targeted coaching, in increasing teachers' implementation fidelity of required procedural components.

During the intervention, low implementation fidelity was directly influenced by teachers' ability to complete required procedures for the accurate delivery of OTRs (i.e., input, prompt/question, monitoring, feedback) and low OTR delivery rates. Consistent with previous findings (Adamson & Lewis, 2017), when delivering OTRs teachers were able to consistently provide students with input related to academic content and prompts or questions that solicited students' response, but often failed to monitor student response and provide students with high-quality feedback (including corrections and affirmations). In addition to challenges teachers experienced with implementing required procedural components, teachers' regular demonstration of low OTR delivery rates during intervention ($M = 0.89$ OTRs per minute, range = 0.33-1.5 OTRs per minute) continued to negatively affect percentage of their implementation fidelity.

When analyzing teachers' implementation fidelity of OTRs according to the actual number of completed procedural components, teachers had an overall mean of 64.6% with a range from 33.0% to 93.0% across the experimental conditions. During post-PD, teachers' level

of implementation fidelity of actual completed components occurred at the moderate level with an overall decreasing trend for both teachers ($M = 57.7\%$, range = 42.9%-80.0%). During the targeted coaching phase, there was an immediate effect with either an immediate increase in performance level (for Mr. Sanderson) or an overall increasing trend (for Ms. Kent) in teacher implementation fidelity of required procedural components for both teacher participants ($M = 78.1\%$, range = 57.6%-93.0%). However, when teachers transitioned to receiving targeted coaching with intentional planning, there was an immediate decrease in teacher implementation fidelity of actual completed components ($M = 50.9\%$, range = 33.0%-70.0%). The Tau-U scores for teacher implementation fidelity of actual completed components ranged from 0.68 to 1.0, with a large behavior change occurring between post-PD and the targeted coaching phase. These effect size estimates continue to support the interpretation of visual analysis and the initial effectiveness of the intervention, specifically targeted coaching, in increasing teachers' implementation fidelity of required procedural components. Additionally, when examining components that directly affected teacher implementation fidelity of completed procedural steps, again teachers' ability to accurately deliver OTRs that included required essential components (i.e., input, prompt/question, monitoring, feedback) resulted in teachers not achieving at least 90% implementation fidelity. As previously stated, teachers were able to consistently provide students with input related to academic content and prompts or questions that solicited students' response, but often forgot to monitor student response and provide students with high-quality feedback (including corrections and affirmations).

Data also revealed that even though teachers were unable to achieve desired delivery rates, post-PD multilevel coaching provided by a school-based coach had a minimal positive effect on teachers' delivery rate of OTRs during teacher-directed instruction. Teachers had an

overall mean of 0.78 OTRs per minute with a range from 0.20 to 1.30 OTRs per minute across the experimental conditions. During post-PD, teachers' delivery rate of OTRs remained well below the desired rate of 3 OTRs per minute (M = 0.51 OTRs per minute, range = 0.60-1.28 OTRs per minute), suggested by MacSuga-Gage and Simonsen (2015). For example, Mr. Sanderson's delivery rate of OTRs across the five post-PD sessions was no more than 0.6 OTR per minute. As with teacher implementation fidelity, there was a slight increase in the level of teachers' delivery rate for both teacher participants after receiving the intervention. This increase was most evident during the targeted coaching phase of the intervention (M = 1.08 OTRs per minute, range = 0.33-1.50 OTRs per minute) with a mean increase of 0.36 OTRs per minute for Mr. Sanderson and 0.69 OTRs per minute for Ms. Kent when compared to their performance during the post-PD condition. Mr. Sanderson continued to increase his OTR delivery rate to 0.81 during the targeted coaching with intentional planning (i.e., a mean increase of 0.09 over his performance during targeted coaching), whereas Ms. Kent decreased her mean OTR delivery rate from 1.30 during targeted coaching to 0.80 during targeted coaching with intentional planning. The Tau-U scores for teachers' delivery rates of OTRs ranged from 0.66 to 0.91 with a large behavior change occurring between post-PD and the first phase of intervention (i.e., targeted coaching). These effect size estimates further support the initial effectiveness of the intervention, specifically targeted coaching, in increasing teachers' delivery rates of OTRs as a critical component of implementation fidelity.

During the intervention phase of the study, several factors may have influenced teachers' ability to achieve the desired rate of ≥3 OTRs per minute. First, research has indicated that teachers at the secondary level often find it more difficult to meet recommended OTR delivery rates when compared to those at the elementary level (Adamson & Lewis, 2017; Hirn & Scott,

2012, MacSuga-Gage & Simonsen, 2015). This in part could be due to common teaching practices used at the secondary level including lecturing and individual student assessment practices (Pas et al., 2014) and/or their beliefs in students' role as active members in the learning process (Turner et al., 2009). Second, the types of content teachers were delivering may have affected their use of various types of OTRs and/or their delivery rate. If teachers were presenting students with new information and delivering increased rates of OTRs, additional wait time may have been required for students to formulate thoughtful responses (Stitcher et al., 2009). Third, anecdotal information gathered during coaching sessions indicated that teachers were not intentionally planning for the inclusion of OTRs during teacher-directed instruction, rather they were trying to embed increased rates of OTRs naturally during their delivery of instruction. Finally, students' low levels of academic engagement may not have presented as significant enough challenging behavior to warrant teachers' investment in making changes to their individual teaching practices (Simonsen et al., 2020).

Teachers' performance in the generalized setting post-PD was consistent with their performance in selected primary instructional blocks. During the intervention phase, when generalizing implementation to a similar instructional block, both teachers we able to demonstrate an increase in their level of implementation fidelity of required ($M = 35.5\%$, range = 24.2%-46.8%) and actual ($M = 72.1\%$, range = 53.5%-90.6%) completed procedural components and OTR delivery rate ($M= 1.4$ OTRs per minute, range = 1.3-1.5 OTRs per minute). However, because generalization data were collected only once post-PD and once during the intervention phase, it is not possible to make direct correlations between multilevel PD and coaching on teachers' implementation of OTRs across instructional settings.

Findings of the teacher participants' performance during post-PD (i.e., baseline) support existing research on the naturally occurring low delivery rates of OTRs presented by teachers during teacher-directed instruction (Commons et al., 2020). Additionally, although the provided universal PD included essential components of effective training (i.e., explicit instruction, modeling, rehearsal, and feedback; Ward-Horner & Sturmey, 2012), teachers' post-PD data further confirmed that one-time inservice trainings are insufficient in producing sustained changes in teacher behavior and increased accuracy of practice implementation (Fixsen et al., 2005; Freeman et al., 2017; Gage et al., 2015; Joyce & Showers, 1995; Lewis & Newcomer, 2002). Results from this study are consistent with previous research that indicates when teachers are provided with effective training followed by continued support in the form of coaching that includes ongoing opportunities for practice and performance feedback, it can assist in increasing their knowledge and implementation of effective, high-leverage classroom management practices, such as OTRs (Freeman et al., 2017; Graseley-Boy et al., 2019; Myers et al., 2011; Reinke et al., 2015). Ms. Wilson (i.e., the school's instructional coach) shared coaching consultations had been particularly productive in helping teachers identify their limited use of OTRs during teacher-directed instruction and that individual sessions with teachers provided her with increased opportunities to discuss specific strengths and areas of growth with teachers. When reflecting on individual coaching sessions, Ms. Wilson commented on how GoReact helped her provide specific feedback to teachers that could then be referenced during and after coaching sessions. Ms. Wilson shared that having time-stamped annotations of performance feedback helped make coaching sessions more efficient and effective, as these annotations prompted additional opportunities for her to engage teachers in modeling and rehearsal of essential components in OTR delivery. Additionally, Ms. Wilson noted that over the course of

the intervention, she was able to witness during observational sessions teachers' intentional implementation of behavior specific feedback that was previous discussed during coaching sessions. For example, post-PD Mr. Sanderson naturally incorporated high rates of individual response options for students during teacher-directed instruction. Based on this information, during a coaching session, Ms. Wilson provided Mr. Sanderson with specific data to demonstrate his low rates of OTRs and extended the coaching consultation by presenting him with specific feedback on how he could naturally incorporate increased rates of OTRs into his instruction. During this coaching consultation, Ms. Wilson facilitated a conversation on ways Mr. Sanderson could use increased rates of OTRs following individual student responses as formative assessment measures to confirm all students' understanding of course content and to further extend his teaching points by providing students with specific feedback. Similarly, Ms. Wilson was able to use specific performance feedback to help support Ms. Kent in using increased rates of OTRs (e.g., choral responding) to emphasize content specific vocabulary terms. Following the coaching session, Ms. Kent anecdotally reported to Ms. Wilson that she had noticed an observable difference in students' use of content specific vocabulary terms during peer collaborations and in written assignments since she had begun incorporating the use of increased rates of OTRs focused on vocabulary terms.

Results from this study are inconsistent with prior studies (Adamson & Lewis, 2017; MacSuaga-Gage & Gage, 2015; MacSuga-Gage & Simonsen, 2015; Messenger et al., 2017; Randolph et al., 2020; Simonsen et al., 2020) in that teacher participants were unable to achieve desired implementation fidelity percentages (i.e., $\geq$ 90%) and recommended rates of OTRs (i.e., $\geq$3 OTRs per min). As previously mentioned, teachers' low implementation fidelity and delivery rates of OTRs may have be attributed to factors such as: (a) common instructional practices (e.g.,

lecturing, individual assessment) implemented at the secondary level; (b) the type of content (i.e., new content, review of previously learned content) that was most often being delivered during teacher-directed instruction; (c) attempts to embed increased OTRs naturally into instruction without intentional planning; (d) teachers' beliefs regarding students role as active members in the learning process; (e) students' behavior may not have been intense enough to warrant teachers' desire to alter their instructional practices; and (f) additional pressures and policy changes associated with COVID-19 that may have resulted in competing interests during the course of the study. Additionally, the lower than desired implementation fidelity percentages (i.e., $\geq$ 90%) and recommended rates of OTRs may suggest both teachers need a more intensified level of coaching support.

Results from this study are consistent with existing research (Gage et al., 2017, 2018; MacSuga-Gage, 2013; Simonsen et al., 2017; Wood et al., 2016) that suggests individual teachers may need varying levels of support (i.e., coaching) in response to initial and ongoing individual performance data to ensure practices are implemented and sustained with fidelity. Due to limited time, in this study I was not able to implement each of the coaching levels within the multilevel PD and coaching framework. However, individual teacher data indicated variations in teachers' response to targeted coaching. Although both teachers demonstrated increased levels in implementation fidelity and OTR delivery rates during targeted coaching, neither teacher was able to achieve pre-determined data-decision rules, indicating teachers needed additional support. During targeted coaching, teachers consistently demonstrated difficulties in accurately delivering essential components of OTRs and in meeting acceptable delivery rates of OTRs. While receiving targeted coaching, data suggest that when teachers consistently participated in data collection procedures, coaching sessions, and data analysis their implementation fidelity

improved. However, during this phase both teachers failed to achieve the desired level of

implementation fidelity (i.e., 90%) with fewer than a rate of 2 OTRs, indicating the need for

targeted coaching with intentional planning. When teachers transitioned to receiving targeted

coaching with intentional planning, there was an immediate decrease in teacher implementation

fidelity with Ms. Kent dropping implementation fidelity below her post-PD level. It is

hypothesized that teachers' lack of response to targeted coaching with intentional planning may

have been a result of various confounding variables such as (a) changes in teachers' instructional

delivery methods in preparation for state assessments, (b) district-wide changes in students'

attendance policy due to COVID-19 regulations which impacted teachers' delivery of instruction

(i.e., in-person and virtual), and (c) end-of-the-year events (e.g., school spirit week) that affected

typical instructional schedules. As noted by Ms. Wilson, "teachers began feeling overwhelmed

by the end of the study" due to extenuating factors related to the end of the school year. In

addition, according to teachers' data, Mr. Sanderson needed more intensive, individualized

coaching after not meeting criterion for ending targeted coaching with intentional planning.

Whereas, had Ms. Kent been provided with additional opportunities to receive targeted coaching

with intentional planning, she may have improved her implementation fidelity and been able to

transition into the maintenance phase.

Additionally, findings from this study also suggest that using a multilevel PD and

coaching framework can increase novice teachers' (e.g., Ms. Kent) implementation of evidence-

based classroom management strategies, such as OTRs. This is important because research has

indicated that preservice teachers receive limited classroom management training as a part of

their preparation programs (Begney & Martens, 2006; Cooper et al., 2018; Freeman et al., 2014;

Gage et al., 2017; Oliver & Reschly, 2010; Simonsen et al., 2014). Finally, results of the current

study support prior research (Reinke et al., 2014; Thompson et al., 2012) that has shown school-based coaches can be effective in supporting teachers' implementation of evidence-based classroom management practices.

Research Question 2: To what degree does post-PD multilevel coaching provided by a school-based coach that is intended to promote teachers' implementation of OTRs increase active student engagement for high school students?

Visual analysis of student engagement data indicated teachers' increased implementation of OTRs within teacher-directed instruction had a positive effect on students' academic engagement. On average, students actively participated in 0.41 OTRs per minute with a range of response rates from 0 OTR per minute to 1 OTR per minute. Tau-U scores for student engagement ranged from 0.73 to 1.0, with a large behavior change occurring between post-PD and the first phase of intervention (i.e., targeted coaching). Changes in students' academic engagement were most likely the result of teachers' changes in OTR delivery rates. During the targeted coaching phase, when teachers' implementation fidelity and OTR delivery rates increased, so did students' overall rate of academic engagement. While the margins of increased student engagement between post-PD and intervention were minimal, the effect size estimates support the interpretation of visual analysis and the initial effectiveness of the intervention in increasing teachers' implementation and delivery rate of OTRs, which in turn positively affected students' academic engagement. Findings of student engagement from this study are consistent with previous research (Common et al., 2020; Haydon et al., 2010; Fitzgerald Leahy et al., 2018; MacSuga-Gage & Simonsen, 2015; Simonsen et al., 2008, 2014; Sutherland et al., 2003) that indicates when students are presented with increased OTRs they are more likely to engage in teacher-directed instruction. Similar to prior studies (Adamson & Lewis, 2017, MacSuga-Gage

& Gage, 2015), during post-PD all four students demonstrated low levels of academic engagement. Once teachers began increasing implementation fidelity and delivery rates of OTRs in the intervention phase, all student participants demonstrated overall higher rates of academic engagement. However, arguably students' academic engagement rates remained less than desirable. Students' low rate of academic engagement may have been directly influenced by teachers' limited delivery rate of OTRs.

Data from this study also suggest that when students were presented with brisk instructional delivery and explicit directions for how to actively participate in presented OTRs, they were more likely to provide a response. For example, when students in Ms. Kent's class were provided with higher rates of OTRs within the same interval, the likelihood that students engaged in each presented OTR was increased. Similarly, when students in Mr. Sanderson's class were presented with explicit directions for how to actively participate in presented OTRs, data indicated students actively participated every time. Finally, results from this study are consistent with existing literature (Menzies et al., 2017; Simonsen et al., 2010, 2014) and continue to emphasize the importance of maximizing instructional time and ensuring learning is an interactive process that actively involves all students. Previous studies (Adamson & Lewis, 2017, Common et al., 2020; MacSuga-Gage & Gage, 2015; MacSuga-Gage & Simonsen, 2015; Menzies et al., 2017; Simonsen et al., 2010, 2014) have shown that when students are actively engaged, they are more likely to experience higher academic achievement. Although academic achievement was not examined in this study, Ms. Kent did anecdotally report that, following the implementation of increased rates of OTRs, she observed an increase in students' use of content specific vocabulary during collaborative and written assignments and that students' responses

during daily formative assessments (e.g., exit tickets) were more comprehensive and aligned to instructional content.

Research Question 3: What are the perceptions of the instructional coach on the importance, acceptance, and effectiveness of multilevel PD and coaching in supporting high school teachers' implementation of OTRs and in increasing students' active engagement?

Research Question 4: What are the perceptions of teachers on the importance, acceptance, and effectiveness of multilevel PD and coaching in supporting their implementation of OTRs and the effects of OTRs on active student engagement of high school students?

Social validity data are designed to measure (a) the social significance and acceptability of goals, (b) the social appropriateness or acceptability of the procedures, and (c) the extent to which results obtained show meaningful, significant, and sustainable change (Cooper et al., 2020; Wolf, 1978). To measure social validity, I collected perceptions of the importance, acceptance, and effectiveness of the intervention from the instructional coach and teachers. Overall, social validity data indicated the school's instructional coach and teachers rated the multilevel PD and coaching framework to be moderately effective in supporting teachers' implementation of high rates of OTRs. The instructional coach and teacher participants' perceptions were mostly positive as they agreed they had observed an increase in active student engagement because of implementing higher rates of OTRs. Despite indicating agreement regarding the ease to which observational data could be collected using GoReact and observed increases in active student engagement as a result of teachers implementing increased rates of OTRs, the school's instructional coach was neutral to statements related to the feasibility of implementation, benefits of the tiered coaching model, and her willingness to recommend the model as an efficient, effective, and sustainable framework for providing training and support on

other evidence-based classroom management strategies. This suggests that although the data

indicated an initial effectiveness of this intervention, the incremental change in teacher and

student behavior may not have been enough for the instructional coach to deem the intervention

acceptable as a systematic schoolwide PD and coaching framework. Additionally, Ms. Wilson's

neutral feelings toward the efficient and effectiveness of the intervention may have been

influenced by several barriers (e.g., limited teacher participants, access to recording devices,

concerns with social distancing, student seating configurations and use of plexiglass, changes in

student attendance policies) that had to initially be overcome prior to and during the study due to

school-, district-, and state-wide regulations and policies pertaining to COVID-19. Finally, Ms.

Wilson provided anecdotal information that confirmed she enjoyed having a systematic way for

identifying teachers for increasing levels of support (i.e., data-decision rules); however, she

indicated she would have appreciated the opportunity to have implemented the multilevel PD

and coaching framework earlier in the year so additional school-based systems and practices

could have been put into place to further support teacher perception and acceptance of coaching

supports and to facilitate their use of increased rates of OTRs as an effective classroom

management practice from the start of the year.

Although teacher perceptions were mostly positive, Mr. Sanderson and Ms. Kent differed

significantly on their perceptions related to their recommendation of high rates of OTRs in

response to addressing challenges in classroom management, the effects of the multilevel PD and

coaching model in supporting their implementation of OTRs, and their willingness to

recommend the model as an efficient, effective, and sustainable framework for providing training

and support on other evidence-based classroom management strategies. Mr. Sanderson reported

feeling neutral to the statements regarding the implementation of increased rates of OTRs and the

coaching model, whereas he disagreed he would recommend the framework to provide training and feedback to others on classroom management practices in the future. Conversely, Ms. Kent indicated she strongly agreed with statements regarding the implementation of increased rates of OTRs, the coaching model, and would recommend the framework to provide training and feedback to others on classroom management practices in the future. The difference in teacher perceptions may be a result of individual experiences that occurred prior to or within the intervention, teacher beliefs regarding instructional delivery and students' role as active participants in the learning process, ability to notice incremental changes in teacher and student behavior because of newly implemented skills, and/or the impact of skills across generalized settings. For example, Mr. Sanderson stated that although he believes increasing student engagement during lessons is "a great idea," he does not believe that recommended response rates are realistic and that OTRs are only effective for providing students opportunities to respond to "lower-level questioning." On the contrary, Ms. Kent appreciated having the opportunity to analyze her own implementation data and observing student reactions during increased delivery rates of OTRs. Ms. Kent also commented at the end of the study that she felt incorporating increased rates of OTRs "made teaching more enjoyable," that she has "observed positive changes in students' engagement in class" but feels as though student engagement would have been greater had she "trained students how to participate in OTRs at the beginning of the year," and that she is "excited to start next year teaching this way."

Consistent with previous research, the overall positive perceptions of the school-based coach and teachers may be attributed to the following factors: (a) ease to which the strategy (i.e., increased rates of OTRs) can be implemented across instructional settings (Myers et al., 2011), (b) observed increases in student engagement (MacSuga-Gage & Gage, 2015; Messenger et al.,

2017; Myers et al., 2011), and (c) ongoing access to graphed individual performance data and timestamped coaching annotations (Simonsen et al., 2020). During this study, teachers were provided with access to graphed individual performance data that included teacher implementation fidelity, OTR delivery rates, and student academic engagement rates. Individual teacher data were updated following each observation session and were reviewed at the beginning of each coaching consultation. Having a visual representation of teachers' performance and students' response helped the school-based coach facilitate conversations with individual teachers regarding goal setting, and guide data-based decisions regarding best next steps in increasing implementation fidelity and/or teachers' delivery rate of OTRs. Additionally, direct coaching feedback (i.e., corrections and affirmations) was provided to teachers using timestamped annotations within GoReact. Although teachers had access to GoReact, neither teacher was interested in learning how to navigate a new system that would only temporarily be used throughout the duration of the study. To accommodate teachers' request, Ms. Wilson (i.e., the school-based coach) provided teachers with a transcription of her annotations from GoReact, which included her comments along with a corresponding timestamp to each observational session teachers submitted. Teachers were asked to view annotations prior to coaching sessions, which then served as discussion and reference points for which opportunities for modeling and rehearsal were then provided.

Research Question 5: What are the perceptions of high school students on the usefulness and effectiveness of teachers' implementation of OTRs during teacher-directed instruction?

In addition to collecting social validity data from the instructional coach and the two teacher participants, I obtained student participants' perceptions on the usefulness and

effectiveness of teachers' implementation of OTRs during teacher-directed instruction. Student

participants reported mostly positive perceptions regarding observed increases in teachers' use of

a variety of OTRs, positive feelings associated with actively participating in class when

presented with increased OTRs, and a better understanding or retention of course content when

teachers used high rates of OTRs. Additionally, student perceptions were mostly positive,

ranging from agree to strongly agree, regarding their perceptions of feeling safe to participate

when their teachers use a variety of OTRs and of teachers' using increased rates of OTRs as a

beneficial strategy to support students' overall learning of course content. As a result of these

perceptions, three of four students agreed or strongly agreed they would recommend that other

teachers use a variety of OTRs during teacher-directed instruction. Consistent with teacher

perceptions, students indicated varying levels of perceptions (ranging from neutral to strongly

agree) related to the ease to which they were able to participate when their teacher presented a

variety of OTRs. Two of four student participants who agreed or strongly agreed it was relatively

easy to participate in teachers' increased rates of OTRs also included statements in their open-

ended responses regarding the positive outcomes (e.g., increased interest in academic content,

reduced feelings of anxiety when responding to instructional questions, inclusive and equal

opportunity to respond for all students) they observed because of teachers' increased

implementation fidelity. Interestingly, one student from each classroom consistently rated

elements of teachers' implementation fidelity and increased rates of OTRs highly, whereas the

other student indicated less consistent ratings. Differences in students' perceptions related to the

ease of participation in increased rates of OTRs may have been influenced by differences in

teachers' behavior and the extent to which students perceived a need for changes to teachers'

instructional delivery. These data also suggest that teachers' difficulty in accurately presenting

essential components of OTRs may have affected students' perception of the ease to which they could effectively participate in presented OTRs. Therefore, these data may also convey that when students are provided with explicit directions regarding how to respond to teacher-directed OTRs, they are more likely to actively respond and to perceive their engagement in course content as enjoyable. Findings regarding the overall positive students' perceptions in the study could be attributed to several factors identified in prior studies. First, implementing increased and varied OTRs have been found to improve students' perception of feeling safe when participating in teacher-directed questioning (MacSuaga-Gage & Simonsen, 2015). During this study, student participants rated they either agreed ($n = 1$) or strongly agreed ($n = 3$) they felt safe in participating in varied OTRs and that OTRs presented inclusive and equitable response opportunities for all students to engage in instruction. Second, previous research has indicated that increased rates of OTRs has been shown to increase students' engagement and enjoyment in class participation (MacSuga-Gage & Gage, 2015; Messenger et al., 2017). Students' perception of increased engagement and enjoyment in class participation in this study may be attributed to teachers increased instructional pacing, use of varied OTRs, reduction in teachers' use of traditional lecturing practices, and students' ability to be more actively engaged in the learning process. Third, prior literature has shown that delivering high rates of OTRs can help teachers establish safe and predictable learning environments that foster increased opportunities for students to engage in errorless learning (i.e., correct responses) and to receive specific feedback on their performance (MacSuga-Gage & Simonsen, 2015; Whitney et al., 2015). Student social validity indicated that all four students felt increased rates of OTRs helped to improve their active participation in class and that performance feedback helped to further confirm their understanding of course content. Fourth, additional studies have confirmed an increase in

students' perception regarding their ability to understand and retain course content when engaging in high rates of OTRs (Adamson & Lewis, 2017). In this study, students indicated they either agreed or strongly agreed that increased rates of varied OTRs helped them better understand or retain course content. This was also evident in the anecdotal comments Ms. Kent made regarding her observations of students' increased use of content vocabulary and improvements in overall formative assessment data.

Contributions

This study makes several contributions to the literature on the use of a multilevel PD and coaching framework to support teachers' implementation of evidence-based classroom management practices, such as OTRs. First, although recommendations have been made regarding optimal delivery rates of OTRs (Council for Exceptional Children, 1987; Hirn & Scott, 2012; Stitcher et al., 2009), there are a paucity of studies (e.g., Adamson & Lewis, 2017, Freeman et al., 2018; Whitney et al., 2015) that have been conducted at the secondary level or that examined OTRs within general education settings. This study further expanded the limited research base supporting the systematic delivery and suggested appropriate rates of OTRs at the secondary level and in general education settings. Second, current research includes a limited number of studies that have examined the use of multilevel PD and coaching within an MTSS framework (e.g., Gage et al., 2017; Grasley-Boy et al., 2019; Mac-Suga-Gage, 2013; Mullan, 2015; Myers et al., 2011; Simonsen et al., 2014; Thompson et al., 2012). Additionally, even though many of these studies focused on increasing teachers' implementation of evidence-based classroom management practices, studies were conducted at the elementary or middle school level. This study added to the minimal research base on the implementation of a multilevel PD and coaching framework within an MTSS framework for use in high schools to support teachers'

implementation of OTRs. Similarly, it provided additional empirical evidence on the use of varying levels of support on teachers' delivery of evidence-based classroom management practices, such as OTRs. Third, many studies (e.g., Gage et al., 2017; Grasley-Boy et al., 2019; Mac-Suga-Gage, 2013; Mullan, 2015; Myers et al., 2011; Simonsen et al., 2014; Thompson et al., 2012) implementing coaching have involved researchers or outside consultants as coaches (i.e., primary interventionist). This study provides initial evidence on the effects and feasibility of using a school-based coach as the primary interventionist in providing a natural support to teachers to aid in improving effective classroom management practices. Furthermore, this study offers initial support for the use of a school-based coach as a systems-level resource to potentially increase the school's capacity to adopt the multilevel PD and coaching framework once the study was over. Finally, although most studies implementing coaching (e.g., DiGennaro et al., 2007; Filcheck et al., 2004; Jager et al., 2002; Kohler et al., 1997; Kretlow et al., 2011, 2012; Stitcher et al., 2006) included a component that offers participants performance feedback, feedback was typically delivered following a direct observational session. As a result of this, during coaching sessions participants were often asked to reflect or recall experiences or events without access to visual examples of their performance. During this study, the school-based coach was able to provide teachers with specific performance feedback (i.e., corrections and affirmations) using GoReact. Using this interactive cloud-based platform in conjunction with teachers recorded observational sessions, the school-based coach was able to provide teachers with a transcript of timestamped annotations that teachers could review before, during, and after coaching sessions. Transcribed annotations helped to make coaching consultations more efficient and effective as they served as a primary resource for facilitating discussion and as reference points by which opportunities for modeling and rehearsal occurred.

Limitations of the Study

Although the outcomes of this study showed promise for the use of a multilevel PD and coaching framework to support teachers' implementation of increased rates of OTRs, this study had several limitations that must be taken into consideration when interpreting the results. First, at the beginning of the study the school was required to adhere to district- and state-wide COVID-19 protocols that encouraged social distancing and required students and teachers to wear masks while together in the classroom. During this time, students were either seated in groups of four with large sheets of plexiglass between each of their desks or in structured rows with all students facing the front of the class. Initially, these restrictions (e.g., glare from plexiglass, masks covering students' faces) presented challenges to data collection as it was difficult with teachers' placement of recording devices to confirm all students' participation in presented OTRs, especially ones requiring students to chorally respond. Once these restrictions were reduced, it allowed for more consistent data reporting throughout the remainder of the study. Similarly, at the beginning of the intervention phase school- and district-wide policies and regulations enforced strict social distancing protocols in response to COVID-19. Therefore, teacher participants were required to participate initially in virtual coaching sessions. As the study progressed, COVID-19 policies and procedures changed allowing the instructional coach and the teacher to meet in person. Although at this point in the year teachers were familiar with meeting virtually, anecdotal data indicated virtual coaching consultation meetings included fewer opportunities for teachers to practice identified skills, less performance feedback on teachers' rehearsal of skills, and fewer teacher-initiated questions related to the delivery of increased rates of OTRs and student engagement. During in-person coaching sessions, teachers appeared to be more engaged and willing to analyze data, discuss areas of strength and growth, engage in

modeling and rehearsal opportunities, and to discuss relevant questions or concerns teachers may have had regarding the delivery of increased rates of OTRs and student engagement. The provision of coaching sessions virtually versus in person might have affected teachers' performance data.

Second, inconsistencies in teachers' data collection procedures and implementation of multilevel coaching sessions may have directly influenced the effects of the intervention. It was documented throughout the duration of the study that both the instructional coach and teacher participants irregularly completed data collection procedures and components of the intervention according to the intended design of the study. As a result of these inconsistencies, there are large gaps in data collection that may have resulted in teachers' decrease in both implementation fidelity and delivery rate. Additionally, during the intervention phase to aid in supporting the scheduling of coaching sessions, the instructional coach and teacher participants were given the flexibility to meet during mutually agreed upon times. Coaching sessions occurred at various times throughout intervention phases which may have directly influenced teacher performance. For example, one teacher might have received coaching support prior to recording weekly instructional observation sessions, whereas the other teacher might have received coaching support at the end of the instructional week after recording instructional observation sessions. Future research should include a set and consistent coaching schedule as part of the multilevel PD and coaching framework to control the duration between teacher consultations and observational sessions. Finally, because teachers recorded and uploaded their own instructional observation sessions, teachers could have potentially selected preferred instructional sessions to share, which may have had an impact on teacher and student data.

Third, I did not measure teachers' implementation fidelity, teachers' delivery rate of OTRs, and students' academic engagement prior to the schoolwide PD. Therefore, it is not possible to determine the effects of the universal PD alone, which may also limit the full range of investigation on the effects of multilevel PD and coaching.

A fourth limitation is that this study did not include measures that examined the use of OTRs in evaluating student learning. Although the study included data on teachers' delivered rate of OTRs during teacher-directed instruction and students' active response rate, it did not report if students' responses were correct/incorrect or the extent to which their responses were associated with academic achievement. Therefore, results of this study do not provide a true representation of students' academic learning.

Fifth, the time of year the study was conducted could be considered a limitation. The study began at the beginning of the school's second semester with only 16 weeks left in the school year. During this time, the school also underwent three district-wide changes in attendance policies due to restrictions associated with COVID-19 protocols ranging from staggered attendance policies to students having the option to attend school in-person. These factors meant the multilevel PD and coaching framework was conducted during a relatively brief period, particularly for teachers and students who entered the intervention phase later in the study. For implementation and data collection purposes, it would be preferable to conduct a study of this nature earlier on in the school year to allow teachers to naturally incorporate evidence-based classroom management practices such as OTRs into their daily instructional routines following training and to provide teacher participants with ample time receiving coaching supports as a part of the intervention phase. Due to the school's required end-of-year testing schedule, teacher participants were also unable to continue their participation in their

respective coaching phases and to collect additional data points in both their primary and secondary instructional blocks. This meant that I was unable to examine teachers' continued response to multilevel coaching, teachers' ability to generalize newly acquired skills across settings, and to determine if changes in teachers' behavior were maintained over time.

Finally, adaptation is a study limitation that warrants consideration. Adaptation, also known as "reactive effect," refers to a potential change in participants' recorded behavior compared to their natural behavior due to novel conditions in which data are being collected (Gast, 2014). Although the presence of observers in the classroom is a common occurrence for teachers who participated in this study, the act of having to video record their instructional lessons knowing they would be viewed by the school's instructional coach may have directly influenced teachers' behaviors. Having to initiate frequent observational recordings on select days may have been an indicator to teachers to focus more specifically on increasing their delivery rate of OTRs and on the incorporation of essential components when presenting OTRs during teacher-directed instruction; yet this may not have been their natural behavior on days when they were not recording instructional sessions. Future research should include opportunities for participants to be exposed to data collection procedures (e.g., video recording) prior to the beginning of the study to increase the likelihood that data collected during baseline are representative of participants' natural behavior.

Suggestions for Future Research

Findings from this study suggest the following recommendations for future research. First, even though the study demonstrated some incremental changes in teachers' implementation and student engagement, future research is needed to confirm the most efficient, effective, sustainable, and socially acceptable multilevel PD and coaching framework. Consistent with

findings from previous research (Gage et al., 2017, 2018; MacSuga-Gage, 2013; Simonsen et al., 2017; Wood et al., 2016), variances in teacher response to PD and coaching necessitate further research to (a) confirm critical components of universal PD that lead to significant changes in teacher behavior, (b) determine data-based decision rules that systematically guide implementation support and maximize school-based resources, (c) determine effects of universal screening in identifying teachers for support, (d) identify appropriate levels of targeted and individualized supports, and (e) include the use of a school-based instructional coach as the primary interventionist. Similarly, due to the limited research in this area, additional research is also needed to further explore these factors across instructional settings and levels (particularly in secondary level), teacher behaviors, student populations, various types of evidence-based classroom management practices, and in relation to academic, behavioral, and social-emotional outcomes for students.

Second, this study examined the effects of the intervention on high school's teachers use of OTRs during teacher-directed instruction. Increasing OTRs is one effective classroom management practice that has been associated with increased rates of on-task behavior (Haydon et al., 2013), improvements in students' fluency and automaticity of basic skills across content areas (Lane et al., 2015), decreased rates of classroom disruption (Sutherland & Wehby, 2001), and its capability to be used as a formative assessment of student understanding (Commons et al., 2020; Lane et al., 2015). However, research has shown that teachers' natural delivery rate of OTRs ranges from 0.57 per min to 1.43 per min (Simonsen et al., 2020). Although recommendations have been made regarding suggested delivery rates of OTRs, teachers' natural delivery rate of OTRs remains well below that of recommend levels. Given teachers' natural delivery rates and the limited knowledge of the application of these rates at the high school level,

future research should further explore appropriate delivery rates of OTRs at the secondary level and the degree to which increased OTRs are effective in accounting for changes in student outcomes beyond academic engagement.

Third, research has consistently demonstrated that poor classroom management can be associated with students receiving more reprimands, evaluated experiences in exclusionary discipline practices that increase in frequency and intensity over time, and experiences that result in fewer satisfying relationships with peers and teachers (Menzies et al., 2017; Mitchell & Bradshaw, 2013; Simonsen et al., 2014). Conversely, teachers who can effectively manage their classrooms are able to maximize student engagement and increase the likelihood of students experience positive behavior and academic outcomes (Mezies et al., 2017; Pas et al., 2014; Simonsen et al., 2014). Therefore, future research is needed to confirm positive, proactive evidence-based classroom and behavior management practices, such as OTRS, at the secondary level that produce positive outcomes for both teachers and students (Simonsen et al., 2010).

Fourth, it is often common practice at the high school level for teachers to rely heavily on lecturing to deliver instruction, which often limits the use of increased rates of OTRs and increases risk factors associated with dropout. Despite the importance of effective classroom management practices, such as OTRs, teachers typically receive limited instructional support in these areas (Simonsen et al., 2010). Based on the insufficient amount of preparation and training many teachers receive related to effective classroom management (Freeman et al., 2014), there is a critical need for future research to continue to explore factors associated with the research-to-practice gap to increase teachers' knowledge and skills in high-leverage evidence-based classroom practices in high school settings.

Fifth, future research is needed to investigate the effects of a multilevel PD and coaching framework on a larger scale that systematically responds to individual teacher needs. Just as multi-tiered systems of support are provided to students based on individual performance data and tailored to meet students' needs, future research is needed to examine the efficiency, effectiveness, sustainability, and social acceptability of a multilevel PD and coaching framework that is responsive to individual teacher needs and provides a fluid continuum of supports according to predetermined data-decision rules.

Sixth, future research is needed to identify ways to evaluate the adequacy and appropriateness of student engagement and student learning. Although increased rates of OTRs have been associated with helping to establish safe and predictable learning environments that foster increased student engagement (Haydon et al., 2013), active student participation (Whitney et al., 2015), increases in the number of correct responses (Lane et al., 2015), and consequently a reduction in inappropriate student behaviors (Sutherland & Wehby, 2001), teachers' presentation of OTRs does not guarantee that students will actively respond. Therefore, future research is needed to explore the various ways in which student engagement (e.g., collaboratively learning opportunities) may be measured and how different engagement types may directly impact student outcomes, such as academic achievement.

Finally, research has shown that dropout events are often associated with extended periods of disengagement for students (Freeman et al., 2015; Jimerson et al., 2000) that include events such as negative interactions with adults and peers, limited interest in academic content, and lack of active participation in their learning (Goss & Andren, 2014). To support efforts in maximizing attendance, sustained engagement, and academic and social outcomes for high school students, researchers recommend dropout prevention addresses alterable classroom-level

variables such as student engagement. Studies have shown that teachers can create safe and predictable learning environments that foster increased student engagement and active student participation (Whitney et al., 2015) by providing students with high rates of OTRs. Therefore, there is a need for future research to examine the relationship between increased rates of OTRs, student engagement, and the effectiveness of dropout prevention efforts.

Implications for Practice

Results from this study suggest several implications for practice. First, findings confirmed previous research that has demonstrated high school teachers' limited use of evidence-based classroom management practices, such as OTRs. Across baseline (post-PD) observation sessions, teachers' natural delivery rates of OTRs were consistently below recommended levels ($M= 0.53$, range $= 0.20$-1.28). Additionally, this study anecdotally demonstrated that when presenting the essential components of OTRs, teachers most often failed to provide students with specific feedback regarding their responses. Given the delivery of increased rates of OTRs has been shown to be an efficient and effective method for improving academic engagement, student behavior, and academic achievement (Haydon et al., 2010; Simonsen et al., 2008, 2014; Sutherland et al., 2003), administrators and instructional coaches in high schools should consider a systematic approach to supporting teachers' implementation of increased rates of OTRs and other high-leverage evidence-based classroom management practices.

Second, the results of this study demonstrated the potential effects teacher implementation of increased rates of OTRs has on student academic engagement. In this study, when teacher implementation fidelity increased, student academic engagement increased. As high school teachers continue to seek effective and efficient ways to address students' demonstration of low level of academic engagement and challenging behaviors, administrators

and instructional coaches should consider confirming and increasing implementation fidelity as an influencing factor in producing positive outcomes for students.

Third, research has shown that often practitioners are provided with limited training in the implementation of evidence-based practices in classroom management (Cooper et al., 2018; Freeman et al., 2014; Oliver & Reschly, 2010), such as OTRs. Additionally, when PD is provided, it is often presented to teachers in the form of relatively passive inservice trainings that have shown to be inadequate in solely producing advancements in sustained systems change and increased accuracy of practice implementation (Fixsen et al., 2005; Freeman et al., 2017; Gage et al., 2015; Joyce & Showers, 1995; Lewis & Newcomer, 2002). In this study, before participating in universal PD on the use of OTRs to increase student engagement, teachers confirmed their limited exposure to training and support related to evidence-based classroom management strategies, including OTRs. Given the confirmation of this information, schools should consider the use of multicomponent approaches to PD that include explicit teaching, coaching, and performance feedback that has the potential to result in desirable increases in teachers' implementation of effective classroom management practices (Simonsen et al., 2017).

Fourth, results from this study indicated using a multilevel PD and coaching framework may be an efficient and effective way to improve high school teachers' implementation of OTRs and student engagement during teacher-directed instruction. Multilevel PD is a data-driven systematic model that uses intensifying levels of PD and coaching support to increase teachers' use of research- and evidence-based instructional practices (Darling-Hammond et al., 2017; Grasley-Boy et al., 2019; Owens et al., 2020). Multilevel coaching models are designed to provide a time- and resource-efficient system structured in a strategic and systematic manner to intentionally incorporate core features of effective PD and continuous coaching support based on

teacher needs (State et al., 2019). The multilevel PD and coaching model also serves an important function in facilitating the transition of knowledge and skills acquired by teachers during PD to implementation within the classroom setting (Freeman et al., 2017). Consistent with previous literature (Gage et al., 2017, 2018; MacSuga-Gage, 2013; Simonsen et al., 2017; Wood et al., 2016), participants in this study required differing levels of support, suggesting that offering a continuum of supports to teachers may increase the probability that teachers will actively engage in skills presented during PD. To facilitate the transition of knowledge and skills acquired by teachers during PD within the classroom setting, schools should consider implementing a multilevel PD and coaching framework that emphasizes the use of explicit teaching, modeling, prompting, use of reinforcement, frequent observations, ongoing progress monitoring, and continued use of data-based decision making to facilitate increases in teachers' learning and implementation of evidence-based classroom management practices (Freeman et al., 2017; Grasley-Boy et al., 2019).

Finally, this study should serve as an initial model for using a school-based coach as the primary interventionist within a multilevel PD and coaching framework to support teachers' implementation of a trained classroom management skill (i.e., OTRs) during daily instruction. Prior research has suggested that practitioners prefer engaging in coaching with a school-based colleague or mentor when obtaining additional information related to academic and behavioral practices (Clunies-Ross et al., 2008; Ficarra & Quinn, 2014; Tillery et al., 2010). Findings from this study indicated that a school-based coach can efficiently and effectively serve as the primary interventionist within a multilevel PD and coaching framework to support teachers' use of increased rates of OTRs. As a cost effective, resource efficient, and potentially sustainable framework for increasing teacher use and implementation fidelity of evidence-based in

classroom management practices, schools should consider the use of a school-based coach when providing teacher support within a multilevel PD and coaching framework.

Summary

This study investigated the effects of multilevel training and coaching support provided by a school-based coach on two high school teachers' use of a trained classroom management skill (namely OTRs) during daily instruction. Results indicated there were small improvements in teachers' implementation fidelity, but teachers failed to achieve the recommended rates of OTRs (i.e., $\geq$ 3 OTR per minute). Additionally, when teachers improved implementation fidelity, students also demonstrated a minimal increase in academic engagement. Although there were several limitations, this study contributed to the limited literature base on multilevel training and coaching support provided by a school-based coach on high school teachers' use of OTRs during teacher-directed instruction.

REFERENCES

Alberto, P. A., & Troutman, A. C. (2007). *Applied behavior analysis for teachers* (8th ed.). Merrill.

Algozzine, B., Barrett, S., Eber, L., George, H., Horner, R., Lewis, T., Putnam, B., Swain-Bradway, J., McIntosh, K., & Sugai, G. (2019). *School-wide PBIS Tiered Fidelity Inventory*. OSEP Technical Assistance Center on Positive Behavioral Interventions and Supports. www.pbis.org

Algozzine, R. F., Wang, C., & Violette, A. S. (2011). Reexamining the relationship between academic achievement and social behavior. *Journal of Positive Behavior Interventions*, *13*(1), 3-16. https://doi.org/10/1177/ 1098300709359084

Allen, J. P., Mikami, A. Y., Hafen, C. A., & Pianta, R. C. (2014). Effects of a professional development program on behavioral engagement of students in middle and high school. *Psychology in the Schools*, *51*(2), 143-163. https://doi.org/10.1002/pits.21741

Alliance for Excellent Education. (2010). *High School Dropouts in America* [Fact Sheet]. www.all4ed.org/publications/reports-fact-sheets/

Archer, A. L., & Hughes, C. A. (2011). Delivering instruction: Eliciting responses. In K. Harris & S. Graham (Eds.). *Explicit instruction: Effective and efficient teaching* (pp. 132-172). The Guilford Press.

Armendariz, F., & Umbreit, J. (1999). Using active responding to reduce disruptive behavior in a general education classroom. *Journal of Positive Behavior Interventions*, *1*(3), 152-158. https://doi.org/10.1177/109830079900100303

Auld, R. G., Belfiore, P. J., & Scheeler, M. C. (2010). Increasing pre-service teachers' use of differential reinforcement: Effects of performance feedback on consequences for student behavior. *Journal of Behavior Education*, *19*(2), 169-183. https://doi.org/10.1007/s10864-010-9107-4

Ayers, K, & Ledford, J. R. (2014). Dependent measures and measurement systems. In D. L. Gast & J. R. Ledford (Eds.), *Single case research methodology: Applications in special education and behavioral sciences* (2nd ed., 124-151). Routledge.

Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis*, *1*(1), 91-97. https://doi.org/10.1901/jaba.1968.1-91

Baker, P. M. (2005). Managing student behavior: How ready are teachers to meet the challenge? *American Secondary Education*, *33*(3), 51-64. https://www.jstor.org/stable/41064554

Begeny, J. C., & Martens, B. K. (2006). Assessing pre-service teachers' training in empirically-validated behavioral instruction practices. *School Psychology Quarterly*, *21*(3), 262-285. https://doi.org/10.1521/scpq.2006.21.3.262

Belfield, C., & Levin, H. M. (Eds.). (2007). *The price we pay: Economic and social consequences of inadequate education.* Brookings Institution Press.

Bethune, K. S. (2017). Effects of coaching on teachers' implementation of tier 1 school-wide positive behavioral interventions and support strategies. *Journal of Positive Behavior Interventions*, *19*(3), 131-142. https://doi.org/10.1177/1098300716680095

Bethune, K. S., & Wood, C. L. (2013). Effects of coaching on teachers' use of function-based interventions for students with severe disabilities. *Teacher Education and Special Education, 36*(2), 97-114. https://doi.org/10.1177/0888406413478637

Biglan, A. (1995). Translating what we know about the context of antisocial behavior into a lower prevalence of such behavior. *Journal of Applied Behavior Analysis*, *28*(4), 479-492. https://doi.org/10.1901/jaba.1995.28-479

Birman, B. F., Desimone, L., Porter, A. C., & Garet, M. S. (2000). Designing professional development that works. *Educational Leadership*, *57*(8), 28-33.

Boardman, A. G., Arguelles, M. E., & Vaughn, S. (2005). Special education teachers' views of research-based practices. *The Journal of Special Education*, *39*(3), 168-180. https://doi.org/10.1177/00224669050390030401

Bohanon, H., Fenning, P., Hicks, K., Weber, S., Thier, K., Aikins, B., Morriseey, K., Briggs, A., Bartucci, G., Mcardle, L., Hoeper, L., & Irvin, L. (2012). A case example of the implementation of schoolwide positive behavior support in a high school setting using change point test analysis. *Preventing School Failure: Alternative Education for Children and Youth*, *56*(2), 91-103. https://doi.org/10.1080/1045988X.2011.588973

Bohanon, H., Flannery, K. B., Malloy, J., & Fenning, P. (2009). Utilizing positive behavior supports in high school settings to improve school completion rates for students with high incidence conditions. *Exceptionality*, *17*(1), 30-44. https://doi.org/10.1080/09362830802590193

Bonneau, K. (2007). *Brief 3: What is a dropout?* (Issue Brief No. 3). North Carolina Department of Public Instruction. https://www.purdue.edu/hhs/hdfs/fii/wp-content/uploads/2015/07/s_ncfis04c03.pdf

Bost, L. W., & Riccomini, P. J. (2016). Effective instruction: An inconspicuous strategy for dropout prevention. *Remedial and Special Education*, *27*(5), 301-311. https://doi.org/10.1177/07419325060270050501

Bradley, R., Danielson, L., & Doolittle, J. (2007). Responsiveness to intervention: 1997 to 2007. *TEACHING Exceptional Children*, *39*(5), 8-12. https://doi.org/10.1177/004005990703900502

Bradshaw, C. P., Koth, C. W., Bevans, K. B., Ialongo, N., & Leaf, P. J. (2008). The impact of school-wide positive behavioral interventions and supports (PBIS) on the organizational health of elementary schools. *School Psychology Quarterly*, *23*(4), 462-473. https://doi.org/10.1037/a0012883

Bradshaw, C. P., Koth, C. W., Thornton, L. A., & Leaf, P. J. (2009). Altering school climate through school-wide positive behavioral interventions and supports: Findings from a group-randomized effectiveness trial. *Prevention Science*, *10*(2)*,* 100-115. https://doi.org/10.1007/s11121-008-0114-9

Bradshaw, C. P., Mitchell, M. M., & Leaf, P. J. (2010). Examining the effects of schoolwide positive behavioral interventions and supports on student outcomes: Results from a randomized controlled effectiveness trial in elementary schools. *Journal of Positive Behavior Interventions*, *12*(3), 133-148. https://doi.org/10.1177/1098300/709334798

Bradshaw, C. P., Pas, E. T., Debnam, K. J., & Lindstrom Johnson, S. (2015). A focus on implementation of Positive Behavioral Interventions and Supports (PBIS) in high schools: Associations with bullying and other indicators of school disorder. *School Psychology Review, 44*(4), 480-498. https://doi.org/10.17105/spr-15-0105.1

Bradshaw, C. P., Pas, E. T., Goldweber, A., Rosenberg, m., & Leaf, P. J. (2012). Integrating school-wide positive behavioral interventions and supports with tier 2 coaching to student support teams: The PBIS*plus* model. *Advances in School Mental Health Promotion*, *5*(3), 177-193. https://doi.org/10.1080/1754730X.2012.707429

Bradshaw, C. P., Reinke, W. M., Brown, L. D., Bevans, B., & Leaf, P. J. (2008). Implementation of School-wide Positive Behavioral Interventions and Supports (PBIS) in elementary schools: Observations from a randomized trial. *Education and Treatment of Children*, *31*(1), 1-26. https://doi.org/10.1353/etc.0.0025

Bradshaw, C. P., Wassdorp, T. E., Debnam, K. J., & Johnson, S. L. (2014). Measuring school climate in high schools: A focus on safety, engagement, and the environment. *Journal of School Health, 84*(9), 593-604. https://doi.org/10.1111/josh.12186

Brownell, M. T., Smith, S. W., McNellis, J. R., & Miller, M. D. (1997). Attrition in special education: Why teachers leave the classroom and where they go. *Exceptionality*, *7*(3), 143-155. https://doi.org/10.1207/s15327035ex0703_1

Burns, M. K., Appleton, J. J., & Stenhouwer, J. D. (2005). Meta-analytic review of responsiveness-to-intervention research: Examining filed-based and research-implemented models. *Journal of Psychoeducational Assessment*, *23*(4), 381-394. https://doi.org/10.1177/073428290502300406

Caldarella, P., Shatzer, R. H., Gray, K. M., Young, K. R., & Young, E. L. (2011). The effects of school-wide positive behavior support on middle school climate and student outcomes. *Research in Middle Level Education Online*, *35*(4), 1-14. https://doi.org/10.1080/19404476.2011.11462087

Capizzi, A. M., Wehby, J. H., & Sandmel, K. (2010). Enhancing mentoring of teacher candidates through consultative feedback on videotaped instructional delivery. *Teacher Education and Special Education*, *33*(3), 191-212. https://doi.org/10.1177/0888406409360012

Carnine, D. W. (1976). Effects of two teacher-presentation rates on off-task behavior, answering correctly, and participation. *Journal of Applied Behavior Analysis*, *9*(2), 199-206. https://doi.org/10.1901/jaba.1976.9-199

Carnine, D. (1997). Bridging the research-to-practice gap. *Exceptional Children*, *63*(4), 513-521. https://doi.org/10.1177/001440299706300406

Carroll, C., Patterson, M., Wood, S., Booth, A., Rick, J., & Balain, S. (2007). A conceptual framework for implementation fidelity. *Implementation Science*, *40*(2), 1-9. https://doi.org/10.1186/1748-5908-2-40

Catterall, J. (1987). An intensive group counseling dropout prevention intervention: Some cautions on isolating at-risk adolescents within high schools. *American Educational Research Journal*, *24*(4), 521-540. https://doi.org/10.3102/00028312024004521

Childs, K., Kincaid, D., George, H., & Gage, N. A. (2016). The relationship between school-wide implementation of positive behavior intervention and supports and student discipline out- comes. *Journal of Positive Behavior Interventions*, *18*(2), 89-99. https://doi.org/10.1177/1098300715590398

Chitiyo, M., May, M. E., & Chitiyo, G. (2012). An assessment of the evidence-base for school-wide positive behavior support. *Education & Treatment of Children*, *35*(1), 1-24. https://doi.org/10.1353/etc.2012.0000

Clunies-Ross, P., Little, E., & Kienhuis, M. (2008). Self-reported and actual use of proactive and reactive classroom management strategies and their relationship with teacher stress and student behavior. *Educational Psychology*, *28*(6), 693-710. https://doi.org/10.1080/01443410802206700

Cohen, D. K., & Ball, D. L. (1999). *Instruction, capacity, and improvement.* CPRE Research Report Series RR-43. Consortium for Policy Research in Education, University of Pennsylvania.

Colvin, G., Kame'enui, E. J., & Sugai, G. (1993). Reconceptualizing behavior management and school wide discipline in general education. *Education and Treatment of Children*, *16*(4), 361-381. https://www.jstor.org/stable/42899326

Colvin, G., Sugai, G., & Patching, B. (1993). Precorrection: An instructional approach for managing predicable problem behaviors. *Intervention in School and Clinic*, *28*(3), 143-150. https://doi.org/10.1177/105345129302800304

Common, E. A., Lane, K. L., Cantwell, E. D., Brunsting, N. C., Oakes, W. P., Germer, K. A., & Bross, L. A. (2020). Teacher-delivered strategies to increase students' opportunities to respond: A systematic methodological review. *Behavioral Disorders*, *45*(2), 67-84. https://doi.org/10.1177/0198742919828310

Conroy, M. A., Alter, P. J., & Sutherland, K. S. (2013). Classroom-based research in the field of EBD: Future research directions. In P., Garner (Ed.), *Handbook of emotional and behavioral difficulties* (pp. 465-477). Sage.

Cook, B. G., Buysse, V., Klinger, J., Landrum, T. J., & McWilliam, R. A. (2015). CEC's standards for classifying the evidence base of practices in special education. *Remedial and Special Education*, *36*(4), 220-234. https://doi.org/10.1177/0741932514557271

Cook, B. G., & Schirmer, B. R. (Eds.). (2006). *What is special about special education: The role of evidence-based practices.* PRO-ED.

Cook, B. G., Tankersley, M., Cook, L., & Landrum, T. J. (2008). Evidence-based practices in special education: Some practical considerations. *Intervention in School and Clinic, 44*(2), 69-75. https://doi.org/10.1177/1053451208321452

Cook., C. G., & Cook, S. C. (2011). *About evidence-based practices in special education.* Council for Exceptional Children's Division of Research. http://higherlogicdownload.s3.amazonaws.com/SPED/b7acd4b4-bc4d-4c1f-a7d4-efab3d52da44/UploadedImages/Quality%20Indicator%20Papers/Thinking_and_Communicating_Clearly_About_Evidence-based_Practices_in_Special_Education.pdf

Cook., C. G., & Cook, S. C. (2013). Unraveling evidence-based practices in special education. *The Journal of Special Education*, *47*(2), 71-82. https://doi.org/10.1177/0022466911420877

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis* (2nd ed.). Merrill.

Cooper, J. O., Heron, T. E., & Heward, W. L. (2020). *Applied behavior analysis* (3rd ed.). Pearson Education.

Cooper, J. T., Gage, N. A., Alter, P. J., LaPolla, S., MacSuga-Gage, A. S., & Scott, T. M. (2018). Educators' self-reported training, use, and perceived effectiveness of evidence-based classroom management practices. *Preventing School Failure: Alternative Education for Children and Youth*, *62*(1), 13-24. https://doi.org/10.1080/1045988X.2017.1298562

Cornett, J., & Knight, J. (2009). Research on coaching. In J. Knight (Ed.), *Coaching: Approaches and perspectives* (pp. 192-216). Corwin Press.

Council for Exceptional Children Evidence-Based Practice Workgroup. (2014). *Council for exceptional children standards for evidence-based practices in special education*. https://www.cec.sped.org/~/media/Images/Standards/CEC%20EBP%20Standards%20co ver/CECs%20Evidence%20Based%20Practice%20Standards.pdf

Counts, J. M-L. (2019). *Investigating the effects of school-based coaching on teachers' presentation of opportunities to respond* [Unpublished doctoral dissertation]. Clemson University.

Darling-Hammond, L., Hyler, M. E., & Gardner, M. (2017). *Effective teacher professional development*. Learning Policy Institute. https://learning-policyinstitute.org/sites/default/files/productfiles/Effective_Teacher_Professional_ Development_REPORT.pdf

Darling-Hammond, L., Wei, R. C., Andree, A., Richardson, N., & Orphanos, S. (2009) State of the profession: Study measures status of professional development, *Journal of Staff Development*, *30*(2), 42-50. https://doi.org/10.1002/pits.21741

Davis, L. L., & O'Neill, R. E. (2004). Use of response cards with a group of students with learning disabilities including those for whom English is a second language. *Journal of Applied Behavior Analysis*, *37*(2), 219-222. http://doi.org/10.1901/ jaba.2004.37-219

Delquadri, J., Greenwood, C. R., & Hall, R.V. (1979). *Opportunity to respond: An update*. [Paper presentation]. Association of Behavior Analysis 5th Annual Meeting, Dearborn, MI, United States.

Denton, C. A., Vaughn, S., & Fletcher, J. M. (2003). Bringing research-based practice in reading intervention to scale. *Learning Disabilities Research & Practice*, *18*(3), 201-211. https://doi.org/10.1111/1540-5826.00075

Desimone, L. M. (2009). Improving impact studies of teachers' professional development: Toward a better conceptualization and measures. *Educational Researcher*, *38*(3), 181-199. https://doi.org/10. 3102/0013189X08331140

DiGennaro, F. D., Martens, B. K., & Kleinmann, A. E. (2007). A comparison of performance feedback procedures on teachers' treatment implementation integrity and students' inappropriate behavior in special education classrooms. *Journal of Applied Behavior Analysis*, *40*(3), 447-461. https://doi.org/10.1901/jaba.2007.40-447

DiGennaro, F. D., Martens, B. K., & McIntyre, L. L. (2005). Increasing treatment integrity through negative reinforcement: Effects on teacher and student behavior. *School Psychology Review*, *34*(2), 220-231. https://doi.org/10.1080/02796015.2005.12086284

Dynarski, M., & Gleason, P. (2002). How can we help? What we have learned from recent federal dropout prevention evaluations. *Journal of Education for Students Placed At Risk*, *7*(1), 43-69. https://doi.org/:10.1207/S15327671ESPR0701_4

Egeberg, H. M., McConney, A., & Price, A. (2016). Classroom management and national professional standards for teachers: A review of the literature on theory and practice. *Australian Journal of Teacher Education*, *41*(7), 1-18. https://doi.org/10.12441/ajte.2016v41n7.1

Elmore, R. (2002). *Bridging the gap between standards and achievement*. The Albert Shanker Institute.

Evertson, C. M., & Weinstein, C. S. (2006). *Handbook of classroom management: Research, practice, and contemporary issues*. Routledge.

Every Student Succeeds Act of 2015, Pub L. No. 114-95 § 114 Stat. 1177 (2015-2016).

Fallon, L. M., Collier-Meek, M. A., Maggin, D. M., Sanetti, L. M. H., & Johnson, A. H. (2015). Is performance feedback for educators an evidence-based practice? A systematic review and evaluation based on single-case research. *Exceptional Children*, *81*(2), 227-246. https://doi.org/10.1177/0014402914551738

Ferster, C. B., & DeMyer, M. K. (1961). The development of performances in autistic children in an automatically controlled environment. *Journal of Chronic Diseases*, *13*(4), 312-345. https://doi.org/ 10.1016/0021-9681(61)90059-5

Ferster, C. B., & DeMyer, M. K. (1962). A method for the experimental analysis of the behavior of autistic children. *American Journal of Orthopsychiatry*, *32*(1), 89-98. https://doi.org/10.1111/j.1939-0025.1962.tb00267.x

Ficarra, L., & Quinn, K. (2014). Teachers' facility with evidence-based classroom management practices: An investigation of teachers' preparation programmes and in-service conditions. *Journal of Teacher Education for Sustainability*, *16*(2), 71-87. https://doi.org/10.2478/jtes-2014-0012

Filcheck, H. A., McNeil, C. B., Greco, L. A., & Bernard, R. S. (2004). Using a whole-class token economy and coaching of teacher skills in a pre- school classroom to manage disruptive behavior. *Psychology in the Schools*, *41*(3), 351-361. https://doi.org/10.1002/pits.10168

Finn, J. D. (1989). Withdrawing from school. *Review of Educational Research*, *59*(2), 117-142. https://doi.org/10.3102/00346543059002117

Fitzgerald Leahy, L. R., Miller, F. G., & Schardt, A. A. (2019). Effects of teacher-directed opportunities to respond on student behavioral outcomes: A quantitative synthesis of single-case design research. *Journal of Behavioral Education*, *28*(1), 78-106. https://doi.org/10.1007/s10864-018-9307-x

Fixsen, D. L., Naoom, S. F., Blase, K. A., Friedman, R. M. & Wallace, F. (2005). *Implementation research: A synthesis of the literature.* University of South Florida, Louis de la Parte Florida Mental Health Institute, The National Implementation Research Network (FMHI Publication #231).

Flannery, K. B., Fenning, P., Kato, M. M., & McIntosh, K. (2014). Effects of school-wide positive behavioral interventions and supports and fidelity of implementation on problem behavior in high schools. *School Psychology Quarterly*, *29*(2), 111-124. https://doi.org/10.1037/spq0000039

Flannery, K. B., Frank, J. L., Kato, M. M., Doren, B., & Fenning, P. (2013). Implementing schoolwide positive behavior support in high school settings: Analysis of eight high schools. *The High School Journal*, *96*(4), 267-282. https://doi.org/10.1353/hsj.2013.0015

Flannery, K. B., Hershfeldt, P., & Freeman, J. (2018). *Lessons learned on implementation of PBIS in high schools: Current trends and future directions.* Center for Positive Behavioral Interventions and Supports (funded by the Office of Special Education Programs, U.S. Department of Education). University of Oregon Press.

Flannery, K. B., & Kato, M. M. (2017). Implementation of SWPBIS in high school: Why is it different? *Preventing School Failure: Alternative Education for Children and Youth*, *61*(1), 69-79. httos://doi.org/10.1080/1045988X.2016.1196644

Flannery, K. B., Sugai, G., & Anderson, C. M. (2009). School-wide Positive Behavior Support in high school: Early lessons learned. *Journal of Positive Behavior Interventions*, *11*(3), 177-185. https://doi.org/10.1177/1098300708316257

Frazelle, S., & Nagel, A. (2015). *A practitioner's guide to implementing early warning systems.* Regional Educational Laboratory at Education Northwest. https://sites.ed.gov/underservedyouth/files/2017/01/MS3-A-Practitioners-Guide-to-Implementing-Early-Warning-Systems.pdf

Freeman, J., Kern, L., Gambino, A. J., Lombardi, A., & Kowitt, J. (2019). Assessing the relationship between the positive behavior interventions and supports framework and student outcomes in high school. *The Journal of At-Risk Issues*, *22*(2), 1-11.

Freeman, J., & Simonsen, B. (2015). Interventions on high school dropout and school completion rates: A systematic review of the literature. *Review of Educational Research*, *85*(2), 205-248. https://doi.org/10.3102/003465431455431

Freeman, J., Simonsen, B., Briere, D. E., MacSuga-Gage, A. S., & Sugai, G. (2014). Pre-service teacher training in classroom management: A review of state accreditation policy and teacher preparation programs. *Teacher Education and Special Education*, *37*(2), 106-120. https://doi.org/10.1177/0888406413507002

Freeman, J., Simonsen, B., McCoach, D. B., Sugai, G., Lombardi, A., & Horner, R. (2015). An analysis of the relationship between implementation of school-wide positive behavior interventions and supports and high school dropout rates. *The High School Journal*, *98*(4), 290-315. https://www.jstor.org/stable/44077793

Freeman, J., Simonsen, B., McCoach, D. B., Sugai, G., Lombardi, A., & Horner, R. (2016). Relationship between School-wide Positive Behavior Interventions and Supports and academic, attendance, and behavior outcomes in high schools. *Journal of Positive Behavior Interventions*, *18*(1), 41-51. https://doi.org/10.1177/1098300715580992

Freeman, J., Sugai, G., Simonsen, B., & Everett, S. (2017). MTSS coaching: Bridging knowing to doing. *Theory Into Practice*, *56*(1) 29-37. https://doi.org/10.1080/00405841.2016.1241946

Frey, A. J., Park, K. L., Browne-Ferrigno, T., & Korfhage, T. L. (2010). The social validity of program-wide positive behavior support. *Journal of Positive Behavior Interventions*, *12*(4), 222-235. https://doi.org/10.1177/10983000709343723

Fuchs, D., Mock, D., Morgan, P. L., & Young, C. L. (2003). Responsiveness-to-intervention: Definitions, evidence, and implications for the learning disabilities construct. *Learning Disabilities Research & Practice*, *18*(3), 157-171. https://doi.org/10.1111/1540-5826.00072

Gage, N. A., Grasley-Boy, N., George, H. P., Childs, K., & Kincaid, D. (2019). A quasi-experimental design analysis of the effects of school-wide positive behavior interventions and supports on discipline in Florida. *Journal of Positive Behavior Interventions*, *21*(1), 50-61. https://doi.org/10.1177/1098300718768208

Gage, N. A., Grasley-Boy, N. M., & MacSuga-Gage, A. S. (2018). Professional development to increase teacher behavior-specific praise: A single-case design replication. *Psychology in the Schools*, *55*(3)*,* 264-277. https://doi.org/10.1177/1098300717693568

Gage, N. A., Larson, A., Sugai, G., & Chafouleas, S. M. (2016). Student perceptions of school climate as predictors of office discipline referrals. *American Educational Research Journal, 53*(3), 492-515. https://doi.org/10.3102/0002831216637349

Gage, N. A., & Lewis, T. J. (2013). Analysis of effect for single-case design research. *Journal of Applied Sport Psychology*, *25*(1), 46-60. https://doi.org/10.1080/10413200.2012.660673

Gage, N. A., MacSuga-Gage, A. S., & Crews, E. (2017). Increasing teachers' use of behavior-specific praise using a multitiered system for professional development. *Journal of Positive Behavior Interventions*, *19*(4), 239-251. https://doi.org/10.1177/1098300717693568

Gage, N. A., MacSuga-Gage, A. S., & Evanovich, L. L. (2015). Training teachers to use antecedent-based classroom management strategies to support inclusion of students with intellectual disabilities: A feasibility study. *Journal of Global Research in Education and Social Science*, *6*(3), 168-176.

Gage, N. A., Sugai, G., Lewis, T. J., & Brzozowy, S. (2015). Academic achievement and school-wide positive behavior supports. *Journal of Disability Policy Studies*, *25*(3), 199-209. https://doi.org/ 10.1177/0014402915598773

Gardner, R., Heward, W. L., & Grossi, T. A. (1994). Effects of response cards on student participation and academic achievement: A systematic replication with inner-city students during whole- class science instruction. *Journal of Applied Behavior Analysis*, *27*(1), 63-71. http://doi.org/10.1901/jaba.1994.27-63

Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal*, *38*(4), 915-945. https://doi.org/10.3102/00028312038004915

Gast, D. L. (2014). General factors in in measurement and evaluation. In D. L. Gast & J. R. Ledford (Eds.), *Single case research methodology: Applications in special education and behavioral sciences* (2nd ed., 85-104). Routledge.

Gersten, R., Fuchs, L. S., Compton, D., Coyne, M., Greenwood, C., & Innocenti, M. S. (2005). QIs for group experimental and quasi-experimental research in special education. *Exceptional Children*, *71*(2), 149-164. https://doi.org/10.1177/001440290507100202

Gilmour, A. F., Wehby, J. H., & McGuire, T. M. (2017). A preliminary investigation of using school-based coaches to support intervention fidelity of a classwide behavior management program. *Preventing School Failure*, *61*(2), 126-135. https://doi.org/10.1080/10459 88X.2016.1214907

Gladney, D., Lo, Y.-y., Kourea, L., & Johnson, H. N. (2021). Using multilevel coaching to improve general education teachers' implementation fidelity of culturally responsive social skill instruction. *Preventing School Failure: Alternative Education for Children and Youth*, *65*(2), 175-184. https://doi.org/10.1080/1045988X.2020.1864715

Goodnight, C. I., Wood, C. L., & Thompson, J. L. (2019). Effects of in-service and coaching to increase kindergarten teachers' use of research-based strategies in beginning reading. *Preventing School Failure*, *64*(1), 67-76 https://doi.org/10.1080/1045988X.2019.1680944

Goss, C. L., & Andren, K. J. (2014). *Dropout prevention*. The Guilford Press.

Grasley-Boy, N., Gage, N. A., & MacSuga-Gage, A. S. (2019). Multitiered support for classroom management professional development. *Beyond Behavior*, *28*(1), 5-12. https://doi.org/10.1177/1074295618798028

Greenwood, C. R., Delquadri, J., & Hall, R. V. (1984). Opportunity to respond and student academic performance. In W. L. Heward, T. E. Heron, D. S. Hill, & J. Trap-Porter (Eds.), *Focus on behavior analysis in education* (pp. 58-88). Charles Merrill.

Gresham, F. M. (2005). Response to intervention: An alternative means of identifying students as emotionally disturbed. *Education and Treatment of Children*, *28*(4), 328-344. https://www.jstor.org/stable/42899857

Gresham, F. M., Reschly, D. J., Tilly, W. D., Fletcher, J., Burns, M., Christ, T., Prasse, D., Vanderwood, M., & Shinn, M. (2005). Comprehensive evaluation of learning disabilities: A response to intervention perspective. *The School Psychologist*, *59*(1), 26-29.

Guskey, T. R., & Yoon, K. S. (2009). What works in professional development? *Phi Delta Kappan*, *90*(7), 495-500.

Hall, R. V., Delquardi, J., Greenwood, C. R., & Thurston, L. (1982). The importance of opportunity to respond in children's academic success. In E. B. Edgar, N. G. Haring, J. R. Jenkins, & C. G. Pious (Eds.), *Mentally handicapped children: Education and training.* University Park Press.

Hall, R. V., Delquardi, J., & Harris, J. (1977, May). *Opportunity to respond: A new focus in the field of applied behavior analysis* [Paper presentation]. Midwest Association for Applied Behavior Analysis, Chicago, IL, United States.

Hall, R. V., Schiefelbusch, R. L., Hoyt, R. K., & Greenwood, C. R. (1989). History, mission, and organization of the Juniper Gardens Children's Project. *Education and Treatment of Children*, *12*(4), 301-329. https://www.jstor.org/stable/42899123

Hammond, C., Linton, D., Smink, J., & Drew, S. (2007). *Dropout risk factors and exemplary programs*: *A technical report*. National Dropout Prevention Center, Communities in Schools, Inc. https://files.eric.ed.gov/fulltext/ED497057.pdf

Hattie, J. (2012). *Visible learning for teachers: Maximizing impact on learning*. Routledge.

Haydon, T., Conroy, M., Sindelar, P., Scott, T. M., Barber, S. B., & Orlando, A. -M. (2010). Comparison of three types of opportunities to respond on student academic and social behaviors. *Journal of Emotional and Behavioral Disorders*, *18*(1), 27-40. https://doi.org/10.1177/1063426609333448

Haydon, T., & Hunter, W. (2011). The effects of two types of teacher questioning on teacher behavior and student performance: A case study. *Education & Treatment of Children*, *34*(2), 229-245. https://doi.org/10.1353/etc.2011.0010

Haydon, T., MacSuga-Gage, A. S., Simonsen, B., & Hawkins, R. (2012). Opportunities to respond: A key component of effective instruction. *Beyond Behavior*, *22*(1), 23-31. https://doi.org.10.1177/107429561202200105

Haydon, T., Mancil, G. R., & Van Loan, C. (2009). Using opportunities to respond in a general education classroom: A case study. *Education and Treatment of Children*, *32*(2), 267-278. https://doi.org/10.1353/etc.0.0052

Haydon, T., Marsicano, R., & Scott, T. M. (2013). A comparison of choral and individual responding: A review of the literature. *Preventing School Failure*, *57*(4), 181-188. httprs://doi.org/10.1080/1 045988x.2012.682184

Hemmeter, M. L., Snyder, P., Kinder, K., & Artman, K. (2011). Impact of performance feedback delivered via electronic mail on preschool teachers' use of descriptive praise. *Early Childhood Research Quarterly*, *26*(1), 96-109. https://doi.org/:10.1016/j.ecresq.2010.05.004

Hershfeldt, P., Pell, K., Sechrest, R., Pas, E., & Bradshaw, C. (2012). Lessons learned coaching teachers in behavior management: The PBISplus coaching model. *Journal of Educational and Psychological Consulting*, *22*(4), 280-299. https://doi.org/10.1080/10474412.2012.731293

Heward, W. L. (1994). Three "low tech" strategies for increasing the frequency of active student response during group instruction. In R. Gardner, III, D. M. Sainato, J. R. Cooper, T. E., Heward, J. W. Eshleman, & T. A. Grossi (Eds.), *Behavior analysis in education: Focus on measurably superior instruction* (pp. 283-320). Brooks/Cole.

Hickman, G. P., Bartholomew, M., Mathwig, J., & Heinrich, R. S. (2008). Differential development pathways of high school dropouts and graduates. The *Journal of Education Research*, *102*(1), 3-14. https://doi.org/10.3200/JOER.102.1.3-14

Hirn, R., & Scott, T. M. (2012). *Academic and behavior response to intervention project*. University of Louisville.

Horn, C. (2010). Response cards: An effective intervention for students with disabilities. *Education and Training in Autism and Developmental Disabilities*, *45*(1), 116-123. https://www.jstor.org/stable/23880155

Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The use of single-subject research to identify evidence-based practice in special education. *Exceptional Children*, *71*(2), 165-179. https://doi.org/10.1177/001440290507100203

Horner, R. H., & Sugai, G. (2000). School-wide behavior support: An emerging initiative. *Journal of Positive Behavioral Interventions*, *2*(4), 231-233. https://doi.org/10.1177/109830070000200407

Horner, R. H., & Sugai, G. (2015). School-wide PBIS: An example of applied behavior analysis implemented at a scale of social importance. *Behavior Analysis in Practice*, *8*(1), 80-85. https://doi.org/10.1007/s40617-015-0045-4

Horner, R. H., Sugai, G., & Anderson, C. M. (2010). Examining the evidence base for school-wide positive behavior support. *Focus on Exceptional Children*, *42*(8), 1-14.

Horner, R. H., Sugai, G., Smolkowski, K., Eber, L., Nakasato, J., Todd, A. W., & Esperanza, J. (2009). A randomized, wait-list controlled effectiveness trial assessing school-wide positive behavior support in elementary schools. *Journal of Positive Behavior Interventions*, *11*(3), 133-144. https://doi.org/10.1177/1098300709332067

Individuals with Disabilities Improvement Act of 2004, Pub L. No. 108-446, 20 U.S.C. x1400 et seq. (2004).

Jager, B., Reezigt, G. J., & Creemers, B. P. (2002). The effects of teacher training on new instructional behavior in reading comprehension. *Teaching and Teacher Education*, *18*(7), 831-842. https://doi.org/10.1016/S0742-051X(02)00046-X

Jenson, E. (2005). *Teaching with the brain in mind*. Association for Supervision and Curriculum.

Jia, Y., Konold, T. R., & Cornell, D. (2015). Authoritative school climate and high school dropout rates. *American Psychological Association*, *31*(2), 289-303. https://doi.org/10.1037/spq0000139

Jimerson, S. R., Egeland B., Sroufe, L., & Carlson, B. (2000). A prospective longitudinal study of high school dropouts: Examining multiple predictors across development. *Journal of School Psychology*, *38*(6), 525-549. https://doi.org/10.1016/S0022440500000510

Joyce, B., & Showers, B. (1980). Improving inservice training: The messages of research. *Educational Leadership*, *37*, 379-385.

Joyce, B., & Showers, B. (1995). *Student achievement though staff development*. White Plaines, Longman.

Joyce, B., & Showers, B. (2002). *Student achievement through staff development* (3rd ed.). Association for Supervision and Curriculum Development.

Kemp, S. E. (2006). Dropout policies and trends for students with and without disabilities. *Adolescence*, *41*(162), 235-250.

Kennedy, M. J., & Thomas C. N. (2012). Effects of content acquisition podcasts to develop preservice teachers' knowledge of positive behavioral interventions and supports. *Exceptionality*, *20*(1), 1-19. https://doi.org/10.1080/09362835.2011.611088

Klingner, J. K., Vaughn, S., Hughes, M. T., & Arguelles, M. E. (1999). Sustaining research-based practices in reading: A 3-year follow-up. *Remedial and Special Education*, *20*(5), 263-274.

Knight, J. (2009). Instructional coaching. In J. Knight, Editor, *Coaching: Approaches and Perspectives* (pp. 29-55). Corwin.

Kohler, F. W., Crilley, K. M., Shearer, D. D., & Good, G. (1997). Effects of peer coaching on teacher and student outcomes. *The Journal of Educational Research*, *90*(4), 240-250. https://doi.org/10.1080/00220671.1997.10544578

Kohler, F. W., Ezell, H. K., & Paluselli, M. (1999). Promoting changes in teachers' conduct of student pair activities: An examination of reciprocal peer coaching. *The Journal of Special Education*, *33*(3), 154-165.

Korpershoek, H., Harms, T., de Boer, H., van Kuijk, M., & Doolaard, S. (2016). A meta-analysis of the effects of class- room management strategies and classroom management programs on students' academic, behavioral, emotional, and motivational outcomes. *Review of Educational Research*, *86*(3), 643-680. https://doi.org/10.3102/0034654315626799

Kortering, L. J., & Braziel, P. M. (1999). Staying in school: The perspective of ninth-grade students. *Remedial and Special Education*, *20*(2), 106-113. https://doi.org/10.1177/074193259902000208

Kraft, M. A., Blazar, D., & Hogan, D. (2018). The effect of teacher coaching on instruction and achievement: A meta-analysis of the causal evidence. *Review of Educational Research*, *88*(4), 547-588. https://doi.org/10.3102/0034654318759268

Kratochwill, T. R., Hitchcock, J., Horner, R., H., Levin, J., R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2010). *What Works Clearinghouse: Single-case design technical documentation*. What Works Clearinghouse. https://files.eric.ed.gov/fulltext/ED510743.pdf

Kretlow, A. G., & Bartholomew, C. C. (2010). Using coaching to improve the fidelity of evidence-based practices: A review of studies. *Teacher Education and Special Education*, *33*(4), 279-299. https://doi.org/10.1177/0888406410371643

Kretlow, A. G., Cooke, N. L., & Wood, C. L. (2012). Using in-service and coaching to increase the accurate use of research-based strategies. *Remedial and Special Education*, *33*(6), 348-361. https://doi.org/10.1177/0741932510395397

Kretlow, A. G., Wood, C. L., & Cooke, N. L. (2011). Using in-service and coaching to increase kindergarten teachers' accurate delivery of group instructional units. *Journal of Special Education*, *44*(4), 234-246. https://doi.org/10.1177/0022466909341333

Lambert, M. C., Cartledge, G., Heward, W. L., & Lo, Y.-y. (2006). Effects of response cards on disruptive behavior and academic responding during math lessons by fourth-grade urban students. *Journal of Positive Behavior Interventions*, *8*(2), 88-99. https://doi.org/10.1177/10983007060080020701

Lan, W., & Lanthier, R. (2003). Changes in students' academic performance and perceptions of school and self before dropping out of schools. *Journals of Education for Students Placed At Risk*, *8*(3), 309-332. https://doi.org/10.1207/S15327671ESPR0803_2

Lane, K. L., Kalberg, J. R., & Shepcaro, J. C. (2009). An examination of the evidence base for function-based interventions for students with emotional and/or behavioral disorders attending middle and high schools. *Exceptional Children*, *75*(3), 321-340. https://doi.org/10.1177/001440290907500304

Lane, K. L., Menzies, H. M., Ennis, R. P., & Oakes, W. P. (2015). *Supporting behavior for school success: A step-by-step guide to key strategies*. Guilford Press.

Lane, K. L., Wehby, J., & Barton-Arwood, S. (2005). Students with and at risk for emotional and behavioral disorders: Meeting their social and academic needs. *Preventing School Failure*, *49(*2), 6-9. https://doi.org/10.3200/PSFL.49.2.6-9

Lassen, S. R., Steele, M. M., & Sailor, W. (2006). The relationship of School-wide Positive Behavior Support to academic achievement in an urban middle school. *Psychology in the Schools*, *43*(6), 701-712. https://doi.org/10.1002/pits.20177

Ledford, J. R., & Gast, D. L. (2018). *Single case research methodology: Applications in special education and behavioral sciences* (3rd ed.). Routledge.

Lee, V. E., & Burkam, D. T. (2003). Dropping out of high school: The role of school organization and structure. *American Educational Research Journal*, *40*(2), 353-393. https://doi.org/10.3102/00028312040002353

Lehr, C. A., Hansen, A., Sinclair, M.F., & Christenson, S. L. (2003). Moving beyond dropout towards school completion: An integrative review of data-based interventions. *School Psychology Review*, *32*(3), 342-364.

Levine, A. (2006). *Educating school teachers.* The Education Schools Project.

Lewis, R. (1999). Teachers coping with stress of classroom discipline. *Social Psychology of Education, 3*(3), 155-171. https://doi.org/10.1023/A:1009627827937

Lewis, T. J., Hudson, S., Richter, M., & Johnson, N. (2004). Scientifically supported practices in emotional and behavioral disorders: A proposed approach and brief review of current practices. *Behavioral Disorders*, *29*(3), 247-259. https://doi.org/10.1177/019874290402900306

Lewis, T. J., & Newcomer, L. (2002). Examining the efficacy of school-based consultation: Recommendations for improving outcomes. *Child & Family Behavior Therapy*, *24*(1), 165-81. https://doi.org/10.1300/J019v24n01_11

Lewis, T. J., & Sugai, G. (1999). Effective behavior support: A systems approach to proactive school-wide management. *Focus on Exceptional Children*, *31*(6), 1-24.

Lignugaris-Kraft, B., & Marchand-Martella, N. (1993). Evaluation of preservice teachers' interactive teaching skills in a Direct Instruction practicum using student teachers as supervisors. *Teacher Education and Special Education*, *16*(4), 309-318.

Lipsey, M. W., & Wilson, D. B. (2001). *Practical meta-analysis*. Sage.

Maag, J. W. (2001). Rewarded by punishment: Reflections on the disuse of positive reinforcement in schools. *Exceptional Children*, *67*(2), 173-186. https://doi.org/10.1177/001440290106700203

Mac Iver, M. A. (2011). The challenge of improving urban high school graduation outcomes: Findings from a randomized study of dropout prevention efforts. *Journal of Education for Students Placed at Risk*, *16*(3), 167-184. https://doi.org/10.1080/10824669.2011. 584497

Mac Iver, M. A., & Mac Iver, D. J. (2010). How do we ensure that everyone graduates? An integrated prevention and tiered intervention model for schools and districts. *New Directions for Youth Development*, *2010*(127), 25-35. https://doi.org/10.1002/ yd.360

MacSuga-Gage, A. S. (2013). *Supporting teachers' professional development: Investigating the impact of a targeted intervention on teachers' presentation of opportunities to respond* [Unpublished doctoral dissertation]. University of Connecticut.

MacSuga-Gage, A. S., & Gage, N. A. (2015). Student-level effects of increased teacher-directed opportunities to respond. *Journal of Behavioral Education*, *24*(3), 273-288. https://doi.org/10.1007/s10864-015-922392

MacSuga-Gage, A. S., & Simonsen, B. (2011). Increasing teachers' use of evidence-based classroom management strategies through consultation: Overview and case studies. *Beyond Behavior*, *20*(2), 4-12.

MacSuga-Gage, A. S., & Simonsen, B. (2015). Examining the effects of teacher-directed opportunities to respond on student outcomes: A systematic review of the literature. *Education & Treatment of Children*, *38*(2), 211-239. https://doi.org/10.1353/etc.2015.0009

Madigan, K., Cross, R. W., Smolkowski, K., & Strycker, L. (2016). Association between Schoolwide Positive Behavioral Interventions and Supports and academic achievement:

A 9-year evaluation. *Educational Research and Evaluation*, *22*(7-8), 402-421. https://doi.org/10.1080/13803611.2016.1256783

Maheady, L., Harper, G. F., Mallette, B., & Karnes, M. (2004). Preparing preservice teachers to implement class wide peer tutoring. *Teacher Education and Special Education*, *27*(4)*,* 408-418.

Mann, D. (1986). Can we help dropouts: Thinking about the undoable. *Teachers College Record*, *87*(3), 307-323.

Marzano, R. J., Marzano, J. S., & Pickering, D. J. (2003). *Classroom management that works: Research-based strategies for every teacher*. ASCD.

Massar, M. M. (2017). *Effects of coach-delivered prompting and performance feedback on teacher use of evidence-based classroom practices student behavior outcomes* [Unpublished doctoral dissertation]. University of Oregon.

Massar, M. M., & Horner, R. H. (2016). *Descriptive analysis of mechanisms affecting coaching in implementation of evidence-based practices*. Wing Institute.

Mayer, G. R. (1995). Preventing antisocial behavior in the schools. *Journal of Applied Behavior Analysis*, *28*(4), 467-478. https://doi.org/10.1901/jaba.1995.28-467

Menzies, H. M., Lane, K. L., Oakes, W. P., & Ennis, R. P. (2017). Increasing students' opportunities to respond: A strategy for supporting engagement. *Intervention in Schooland Clinic*, *52*(4), 204-209. https://doi.org/10.1177/1053451216659467

Merrett, F., & Wheldall, K. (1993). How do teachers learn to manage classroom behavior? A study of teachers' opinions about their initial training with special reference to classroom behavior management. *Educational Studies*, *19*(1), 91-106 https://doi.org/10.1080/0305569930190106

Mitchell, B. S., Hatton, H., & Lewis, T. J. (2018). An examination of the evidence-base of school-wide positive behavior interventions and supports through two quality appraisal processes. *Journal of Positive Behavior Interventions*, *20*(4), 239-250. https://doi.org/10.1177/1098300718768217

Mitchell, B. S., Hirn, R., G., & Lewis, T. J. (2017). Enhancing effective classroom management in schools: Structures for changing teacher behavior. *Teacher Education and Special Education*, *40*(2), 140-153. https://doi.org/10.1080/00405841.2016.1241946

Mitchell, M. M., & Bradshaw, C. P. (2013). Examining classroom influences on student perceptions of school climate: The role of classroom management and exclusionary discipline strategies. *Journal of School Psychology*, *51*(5), 599-610. https://doi.org/10.1016/j.jsp.2013.05.005

Moore-Partin, T. C., Robertson, R., Maggin, D. M., Oliver, R. M., & Wehby, J. H. (2010). Using teacher praise and opportunities to respond to promote appropriate student behavior. *Preventing School Behavior*, *54*(3), 172-178. https://doi.org/10.1080/10459880903493179

Mullan, P. J. (2015). T*he effects of multi-tiered support system inspired framework for professional development on teacher implementation of discrete trial training* [Unpublished doctoral dissertation]. University of Washington.

Muscott, H. S., Mann, E. L., & LeBrun, M. R. (2008). Positive Behavioral Interventions and Supports in New Hampshire: Effects of large-scale implementation of schoolwide positive behavior support on student discipline and academic achievement. *Journal of Positive Behavior Interventions*, *10*(3), 190-205. https://doi.org/10.1177/1098300708316258

Myers, D. M., Simonsen, B., & Sugai, G. (2011). Increasing teachers' use of praise with a response-to-intervention approach. *Education and Treatment of Children*, *34*(1), 35-59. https://doi.org/10.1353/etc.2011.0004

National Center for Education Statistics. (2020). *High school graduate rates*. https://nces.ed.gov/fastfacts/display.asp?id=805

Nield, R. (2009). Falling off track during the transition to high school: What we know and what can be done. *The Future of Children*, *19*(1), 53-76. https://doi.org/10.1353/foc.0.0020

Nield, R. C., Stoner-Eby, S., & Furstenberg, F. F. (2008). Connecting entrance and departure: The transition to ninth grade and high school dropout. *Education and Urban Society*, *40*(5), 543-569. https://doi.org/10.1177/0013124508316438

No Child Left Behind Act (2002). 20 U.S.C. § 6301 et seq.

Noell, G. H., Witt, J. C., Slider, N. J., Connell, J. E., Gatti, S. L., Williams, K. L., Koeing, J. L., Resetar, J. L., & Duhon, G. J. (2005). Treatment implementation following behavioral consultation in schools: A comparison of three follow-up strategies. *School Psychology Review*, *34*(1)*,* 87-106. https://doi.org/10.1080/02796015.2005.12086277

Noltemeyer, A., Palmer, K., James, A. G., & Wiechman, S. (2019). School-wide positive behavioral interventions and supports (SWPBIS): A synthesis of existing literature. *International Journal of School and Educational Psychology*, *7*(4), 253-262. https://doi.org/10.1080/21683603.2018.1425169

Odom, S., Brantlinger, E., Gersten, R., Horner, R. H., Thompson, B., & Harris, K. R. (2005). Research in special education: Scientific methods and evidence-based practices. *Exceptional Children*, *71*(2), 137-148. https://doi.org/10.1177/001440290507100201

Oliver, R. M., & Reschly, D. J. (2007). *Effective classroom management: Teacher preparation and professional development.* National Comprehensive Center for Teacher Quality.

Oliver, R. M., & Reschly, D. J. (2010). Special education teacher preparation in classroom management: Implications for students with emotional and behavioral disorders. *Behavioral Disorders*, *35*(3), 188-199. https://doi.org/10.1177/019874291003500301

Oliver, R., Wehby, J., & Reschly, D. J. (2011). Teacher classroom management practices: Effects on disruptive or aggressive student behavior. *Campbell Systematic Reviews*, *7*(1), 1-55. https://doi.org/10.4073/csr.2011.4

Owens, T. L., Lo, Y.-y., & Collins, B. C. (2020). Using tiered coaching and bug-in-ear technology to promote teacher implementation fidelity. *The Journal of Special Education*, *54*(2), 67-79. https://doi.org/10.1177/0022466919852706

Parsonson, B. S., & Baer, D. M. (1992). The visual analysis of data, and current research into the stimuli controlling it. In T. R. Kratochwill, & J. R. Levin (Eds.). *Single-case research design and analysis: New directions for psychology and education*. Lawrence Erlbaum Associates.

Peterson, D. S., Taylor, B. M., Burnham, B., & Schock, R. (2009). Reflective coaching conversations: A missing piece. *The Reading Teacher*, *62*(6), 500-509. https://doi.org/10.1598/RT.62.6.4

Phelan, W. (1987). Obstacles to high school graduation: The real dropout problem. *Journal of Education Equity and Leadership*, *7*(3), 223-234.

Prevatt, F., & Kelly, F. D. (2003). Dropping out of school: A review of intervention programs. *Journal of School Psychology*, *41*(5), 377-395. https://doi.org/10.1016/S0022-4405(03)00087-6

Putnam, R., Romano, S., Agorastou, M., Baker, E., Irvin, L., O'Connell, D., Screiner, S., & Stone, L. (2009). Establishing and maintaining staff participation in PBIS high schools. In B. Flannery & G. Sugai (Eds.), *SWPBIS implementation in high schools: Current practice and future directions* (pp. 43-56). University of Oregon.

Randolph, J. J. (2007). Meta-analysis of the research on response cards: Effects on test achievement, quiz achievement, participation, and off-task behavior. *Journal of Positive Behavior Interventions*, *9*(2), 113-128. https://doi.org/10.1177/1098300707009002020

Randolph, K. M., Duffy, M. L., Brady, M. P., Wilson, C. L., & Scheeler, M. C. (2020). The impact of iCoaching on teacher delivered opportunities to respond. *Journal of Special Education Technology*, *35*(1), 15-25. https://doi.org/10.1177/0162643419836414

Reinke, W. M., Stormont, M., Herman, K. C., & Newcomer, L. (2014). Using coaching to support teacher implementation of classroom-based interventions. *Journal of Behavioral Education*, *23*(1), 150-167. https://doi.org/:10.1007/s10864-013-9186-0

Reinke, W. M., Stormont, M., Herman, K. C., Wang, Z., Newcomer, L., & King, K. (2014). Use of coaching and behavior support planning for students with disruptive behavior within a universal classroom management program. *Journal of Emotional and Behavioral Disorders*, *22*(2), 74-82. https://doi.org/10.1177/1063426613519820

Reschly, A., & Christenson, S. L. (2006). Promoting school completion. In G. Bear & K. Minke (Eds.), *Children's needs: III. Understanding and addressing the developmental needs of children* (pp. 103-113). National Association of School Psychologists.

Reupert, A., & Woodcock, S. (2010). Success and near misses: Pre-service teachers' use, confidence, and success in various classroom management strategies. *Teaching and Teacher Education*, *26*(6), 1261-1268. https://doi.org/10.1016/j.tate.2010.03.003

Roderick, M., & Camburn, E. (1999). Risk and recovery from course failure in the early years of high school. *American Educational Research Journal*, *36*(2), 303-343. https://doi.org/10.3102/00028312036002303

Ross, P., & Sliger, B. (2015). The current state of evidence-based practices with classroom management. *National Social Science Journal*, *43*(2), 89-94. https://scholarworks.waldenu.edu/cel_pubs/85/

Rowley, G. (1978). The relationship of reliability in classroom research to the amount of observation: An extension of the Spearman-Brown formula. *Journal of Educational Measurement*, *15*(3), 165-180. https://www.jstor.org/stable/1433662

Rumberger, R.W. (1995). Dropping out of middle school: A multilevel analysis of students and schools. *American Educational Research Journal*, *32*(3), 583-625. https://doi.org/10.3102/00028312032003583

Rumberger, R. W. (2011). *Dropping out: Why students drop out of high school and what can be done about it*. Harvard University Press. https://doi.org/10.4159/ harvard.9780674063167

Rumberger, R. W., & Rotermund, S. (2012). The relationship between engagement and high school dropout. In S. L. Christenson, A. L. Reschley, & C. Wylie (Eds), *Handbook of research on student engagement* (pp. 491-513). Springer Science. https://doi.org/10.1007/978-1-4614-2018-7_24

Russo-Campisi, J. (2017). Evidence-based practices in special education: Current assumptions and future considerations. *Child Youth Care Forum*, *46*(2), 193-205. https://doi.org/10.1007/s10566-017-9390-5

Sadler, C., & Sugai, G. (2009). Effective behavior and instructional support: A district model for early identification and prevention of reading and behavior problems. *Journal of Positive Behavior Interventions*, *11*(1), 35-46. https://doi.org/10.1177/1098300708322444

Safran, S. P., & Oswald, K. (2003). Positive behavior supports: Can schools reshape disciplinary practices? *Exceptional Children*, *69*(3), 361-373. https://doi.org/10.1177/001440290306900307

Sailor, W., Doolittle, J., Bradley, R., & Danielson, L. (2009). Response to intervention and positive behavior support. In W. Sailor, G. Sugai, & R. Horner (Eds.), *Handbook of positive behavior support*. Springer Science + Business Media.

Sanetti, L. M., & Collier-Meek, M. A. (2015). Data-driven delivery of implementation supports in a multi-tiered framework: A pilot study. *Psychology in the Schools*, *52*(8), 815-828. https://doi.org/10.1002/pits.21861

Scanlon, D., & Mellard, D. F. (2002). Academic and participation profiles of school-age dropouts with and without disabilities. *Exceptional Children*, *68*(2), 239-258. https://doi.org/10.1177/001440290206800206

Schargel, F. P., & Smink, J. (2001). *Strategies to help solve our school dropout problem.* Eye on Education.

Schnorr, C. I. (2013). *Effects of multilevel support on first-grade teachers' use of research-based strategies during beginning reading instruction* [Unpublished doctoral dissertation]. University of North Carolina at Charlotte.

Schnorr, C. I., Freeman-Green, S., & Test, D. W. (2015). Response cards as a strategy for increasing opportunities to respond: An examination of the evidence. *Remedial and Special Education*, *37*(1), 41-54. https://doi.org/10.1177/074193251557561

Simonsen, B., Eber, L., Black, A. C., Sugai, G., Lewandowski, H., Sims, B., & Myers, D. (2012). Illinois statewide positive behavioral interventions and supports: Evolution and impact on student outcomes across years. *Journal of Positive Behavior Interventions*, *14*(1), 5-16. https://doi.org/10.1177/1098300711412601

Simonsen, B., Fairbanks, S., Briesch, A., Myers, D., Sugai, G. (2008). Evidence-based practices in classroom management: Considerations for research to practice. *Education and Treatment of Children*, *31*(3), 351-380. https://www.jstor.org/stable/42899983

Simonsen, B., Freeman, J., Dooley, K., Maddock, E., Kern, L., & Myers, D. (2017). Effects of targeted professional development on teachers' specific praise rates. *Journal of Positive Behavior Interventions*, *19*(1), 37-47. https://doi.org/10.1177/1098300716637192

Simonsen, B., Freeman, J., Myers, D., Dooley, K., Maddock, E., Kern, L., & Byun, S. (2020). The effects of targeted professional development on teachers' use of empirically

supported classroom management practices. *Journal of Positive Behavior Interventions*, *22*(1), 3-14. https://doi.org/10.1177/10983000719859615

Simonsen, B., MacSuga-Gage, A. S., Briere, D. E., Freeman, J., Myers, D., Scott, T. M., & Sugai, G. (2014). Multitiered support framework for teachers' classroom management practices: Overview and case study of building the triangle for teachers. *Journal of Positive Behavior Interventions*, *16*(3), 179-190. https://doi.org/10.1177/10983007134844062

Simonsen, B., & Myers, D. (2015). *Classwide positive behavior interventions and supports: A guide to proactive classroom management*. The Guilford Press.

Simonsen, B., Myers, D., & DeLuca, C. (2010). Providing teachers with training and performance feedback to increase use of three classroom management skills: Prompts, opportunities to respond, and reinforcement. *Teacher Education in Special Education, 33*(4), 300-318. https://doi.org/10.1177/0888406409359905

Singer, G. H. S. (2000). Special education research agenda in the United States: Sources of influence. *Exceptionality*, *8*(4), 235-247. https://doi.org/10.1207/S15327035EX0804_2

Skinner, B. F. (1938). *The behavior of organisms: An experimental analysis*. Appleton- Century.

Smart, J. B., & Igo, L. B. (2010). A grounded theory of behavior management strategy selection, implementation, and perceived effectiveness reported by first-year elementary teachers. *The Elementary School Journal*, *110*(4), 567-584. https://doi.org/10.1086/651196

Solomon, B. G., Klein, S. A., Hintze, J. M., Cressey, J. M., & Peller, S. L. (2012). Meta-analysis of school-wide positive behavior support: An exploratory study using single-case synthesis. *Psychology in the Schools*, *49*(2), 105-121. https://doi.org/10.1002/pits.20625

Sprick, R., Knight, J., Reinke, W., & McKale, T. (2006). *Coaching classroom management: Strategies and tools for administrators and coaches*. Pacific Northwest Publishing

State, T. M., Simonsen, B., Hirn, R. G., & Willis, H. (2019). Bridging the research-to-practice gap through effective professional development for teachers working with students with emotional and behavioral disorders. *Behavioral Disorders*, *44*(2), 107-116. https://doi.org/10.117 7/019874291816447

Stitcher, J. P., Lewis, T. J., Richter, M., Johnson, N. W., & Bradley, L. (2006). Assessing antecedent variables: The effects of instructional variables on student outcomes through in-service and peer coaching professional development models. *Education and Treatment of Children*, *29*(4), 665-692. https://doi.org/108.82.202.105

Stichter, J. P., Lewis, T. J., Whittaker, T. A., Richter, M., Johnson, N. W., & Trussell, R. P. (2009). Assessing teacher use of opportunities to respond and effective classroom management strategies: Comparisons among high- and low-risk elementary schools.

Journal of Positive Behavior Interventions, *11*(2), 68-81.
https://doi.org/10.1177/109830070832659

Stormont. M., Reinke, W., & Herman, K. (2011). Teachers' characteristics and ratings for evidence-based behavioral interventions. *Behavioral Disorders*, *37*(1), 19-29. https://doi.org/10.1177/019874291103700103

Stronge, J. H., Ward, T. J., & Grant, L. W. (2011). What makes good teachers good? A cross-case analysis of the connection between teacher effectiveness and student achievement. *Journal of Teacher Education*, *62*(4), 339-355. https://doi.org/10.1177/0022487111404241

Sugai, G., & Horner, R. H. (2002). The evolution of discipline practices: School-wide positive behavior supports. *Child and Family Behavior Therapy*, *24*(1-2), 23-50. https://doi.org/10.1300/J019v24n01_03

Sugai, G., & Horner, R. H. (2006). A promising approach for expanding and sustaining School-Wide Positive Behavior Support. *School Psychology Review*, *35*(2)*, 245-259.

Sugai, G., & Horner, R. H. (2008). What we know and need to know about preventing problem behavior in schools. *Exceptionality*, *16*(2), 67-77. https://doi.org/10.1080/09362830903235375

Sugai, G., & Horner, R. H. (2009). Defining and describing school- wide positive behavior support. In W. Sailor, G. Dunlap, G. Sugai, & R. Horner (Eds.), *Handbook of positive behavior support* (pp. 307-326). Springer Science + Business Media.

Sugai, G., & Horner, R. H. (2010). Schoolwide positive behavior supports: Establishing a continuum of evidence-based practices. *Journal of Evidence-Based Practices for Schools*, *11*(1), 62-83.

Sugai, G., Horner, R. H., Algozzine, R., Barrett, S. Lewis, T., Anderson, C., Bradley, R., Choi, J. H., Dunlap, G., Eber, L., George, H., Kincaid, D., McCart, A., Nelson, M., Newcomer, L. Putnam, R. Riffel, L., Rovins, M., Sailor, W., & Simonsen, B. (2010). *School-wide positive behavior support: Implementers' blueprint and self-assessment.* University of Oregon.

Sugai, G., Horner, R. H., Dunlap, G., Hieneman, M., Lewis, T. J., Nelson., C. M., Scott, T., Liaupsin, C., Sailor, W., Turnbull, A. P., Turnbull H. R. III, Wickham, D., Wilcox, B., & Ruef, M. (2000). Applying positive behavior support and functional behavioral assessments in schools. *Journal of Positive Behavioral Interventions*, *2*(3), 131-133. https://doi.org/10.1177/1098300700000200302

Sugai, G., Horner, R. H., & Lewis, T. (2009). *School-wide positive behavior support implementers' blueprint and self-assessment*. OSEP TA-Center on Positive Behavioral Interventions and Supports.

Suh, S., & Suh, J. (2007). Risk factors and levels of risk for high school dropouts. *Professional School Counseling*, *10*(3), 297-306. https://search-proquest-com.librarylink.uncc.edu/docview/62045235?accountid=14605

Sutherland, K. S., Alder, N., & Gunter, P. L. (2003). The effect of varying rates of opportunities to respond to academic requests to respond to academic requests on the classroom behavior of students with EBD. *Journal of Emotional and Behavioral Disorders*, *11*(4), 239-248. https://doi.org/10.1177/10634266030110040501

Sutherland, K. S., Lewis-Palmer, T., Stichter, J., & Morgan, P. L. (2008). Examining the influence of teacher behavior and classroom context on the behavioral and academic outcomes for students with emotional or behavioral disorders. *Journal of Special Education*, *41*(4), 223-233. https://doi.org/10.1177/0022466907310372

Sutherland, K. S., & Oswald, D. P. (2005). The relationship between teacher and student behavior in classrooms for students with emotional and behavioral disorders: Transactional processes. *Journal of Child and Family Studies*, *14*(1), 1-14. https://doi.org/10.1007/s10826-005-1106-z

Sutherland, K. S., & Wehby, J. H. (2001). Exploring the relation- ship between increased opportunities to respond to academic requests and the academic and behavioral outcomes of students with EBD: A review. *Remedial and Special Education*, *22*(2), 113-121. https://doi.org/10.1177/074193250102200205

Swanson, C. B., & Editorial Projects in Education, B. D. (2009). *Cities in crisis: Closing the graduation gap. Educational and economic conditions in America's largest cities*. Editorial Projects in Education.

Thompson, M. T., Marchant, M., Anderson, D., Prater, MA., & Gibb, G. (2012). Effects of tiered training on general educators' use of specific praise. *Education and Treatment of Children*, *35*(4), 521-546. https://doi.org/10.1353/etc.2012.0032

Thompson, T. I., & Grabowski, J. G. (1973). Reinforcement schedules and multioperant analysis. *Behavior Therapy*, *4*(3), 476.

Tillery, A. D., Varjas, K., Meyers, J., & Smith Collins, A. (2010). General education teachers' perceptions of behavior management and intervention strategies. *Journal of Positive Behavior*, *12*(2), 86-102. https://doi.org/10.1177/1098300708330879

Turner, J. C., Christensen, A., & Meyer, D. K. (2009). Teachers' beliefs about student learning and motivation. In L. J. Saha & A. G. Sworkin (Eds.). *International Handbook of Research on Teachers and Teaching* (pp. 361-371). Springer. https://doi.org/10.1007/978-0-387-73317-3_23

Waasdorp, T. E., Bradshaw, C. P., & Leaf, P. J. (2012). The impact of schoolwide *positive* behavioral interventions and supports on bullying and peer rejection: A randomized controlled effectiveness trial. *Archives of Pediatrics & Adolescent Medicine*, *166*(2), 149-156. https://doi.org/ 10.1001/archpediatrics.2011.755

Walker, H. M., Horner, R. H., Sugai, G., & Bullis, M. (1996). Integrated approaches to preventing antisocial behavior patterns among school-age children and youth. *Journal of Emotional and Behavioral Disorders*, *4*(4), 194-209. https://doi.org/10.1177/106342669600400401

Ward-Horner, J., & Sturmey, P. (2012). Component analysis of behavior skills training in functional analysis. *Behavioral Interventions*, *27*(2), 75-92. https://doi.org/10.1002/bin.1339

Wei, R. C., Darling-Hammond, L., Andree, A., Richardson, N., & Orphanos, S. (2009). *Professional learning in the learning profession: A status report on teacher development in the United States and abroad*. National Staff Development Council.

West, R. P., & Sloane, H. N. (1986). Teacher presentation rate and point delivery rate. Effects on classroom disruption, performance accuracy, and response rate. *Behavior Modification*, *10*(3), 267-286. http://doi.org/10.1177/01454455860103001

What Works Clearinghouse. (2020). *Procedures and standards handbook* (Version 4.1). https://ies.ed.gov/ncee/wwc/Handbooks

Whitney, T., Cooper, J. T., & Lingo, A. S. (2015). Providing student opportunities to respond in reading and mathematics: A look across grade levels. *Preventing School Failure: Alternative Education for Children and Youth*, *59*(1), 14-21. https://doi.org/10.1080/1045988X.2014.919138

Willis, H., Wehby, J., Caldarella, P., Kamps, D., & Romine, R. S. (2018). Classroom management that works: A replication trial of the CW-FIT program. *Exceptional Children*, *84*(4), 437-456. https://doi.org/10.1177/0014402918771321

Wilson B.G. (1996) *Constructivist Learning Environments: Case Studies in Instructional Design*. Educational Technology Publications.

Wolery, M. R., Bailey, D. B., Jr., & Sugai, G. M. (1988). *Effective teaching: Principles and procedures of applied behavior analysis with exceptional students.* Allyn & Bacon.

Wolf, M. M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis*, *11*(2), 203–214. https://dx.doi.org/10.1901%2Fjaba.1978.11-203

Wood, C. L., Goodnight, C. I., Bethune, K. S., Preston, A. I, & Cleaver, S. L. (2016). Role of professional development and multi-level coaching in promoting evidence-based practice in education. *Learning Disabilities: A Contemporary Journal, 14*(2), 159-170.

Yoon, K. S., Duncan, T., Lee, S. W.-Y., Scarloss, B., & Shapley, K. (2007). *Reviewing the evidence on how teacher professional development affects student achievement* (Issues & Answers Report, REL 2007– No. 033). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest. http://ies.ed.gov/ncee/edlabs

Zirkel, P. A. (2008). A legal roadmap of SBR, PRR, and related terms under the IDEA. *Focus on Exceptional Children*, *40(*5), 1-5. https://search.proquest.com/openview/10ee8014f5afd3e91ba5f3573b456733/1?pq-origsite=gscholar&cbl=48488

APPENDIX A
Recruitment Meeting Script - Principal

The researcher will cover the following throughout the interview/meeting:

Reason for meeting:
"My name is Holly Johnson, and I am part of a research team in the Department of Special Education and Child Development at the University of North Carolina at Charlotte. I have asked to meet with you today to discuss your potential participation in a study that we are conducting."

Purpose of study:
"I would like to explain the purpose of the study. I am interested in evaluating effects of multilevel training and coaching support on teachers' use of a trained classroom management skill, known as opportunities to respond (OTR), during daily instruction. Specifically, we would like to examine the effects of teachers' implementation of OTR on active student engagement and the effects of multilevel coaching support on teacher implementation fidelity.

If you agree to participate, your role will include:
1. Recommending a potential school-based instructional coach and potential teachers for the project who meet inclusion criteria
2. Assisting in the scheduling of a virtual schoolwide training on OTR for instructional staff (30 minutes)
3. Allocating time for the selected school-based instructional coach to virtually conduct coaching sessions (duration [3-10 minutes per session] and frequency [1-3 times a week] will depend on level of support) and virtual data collection two to three times a week during teacher-delivered instructional session (5-15 minutes)

Researcher will ask the potential participant to confirm whether he/she is interested in participating.

Participation and consent:
"Before you make a decision, I would like to review with you the informed consent process and documents which provide important information to potential participants." Researcher will provide a general overview of informed consent documents (Appendix E-F) with the principal. "Please take some time to review the informed consent documents and to determine whether you would like your school to participate in the study. I am available to answer any questions you might have either now or later by email or phone. My email is: hjohns76@uncc.edu and my phone number is: 678.773.6473."

APPENDIX B
Letter of Support

Wade Hampton High School
GREENVILLE COUNTY SCHOOLS

December 16, 2020

Holly Johnson:

As the Principal of Wade Hampton High School, I support the research project entitled *Effects of Multilevel Coaching on Teachers' Implementation of Opportunities to Respond.* The purpose of this study is to evaluate the effects of multilevel training and coaching support on high school teachers' use of a trained classroom management skill (namely, opportunities to respond [OTR]) during daily instruction. Opportunities to respond invite or solicit student response through verbal (e.g., answering a question), gestured (e.g., raising their hand if they agree with a statement), or written (e.g., writing a response) formats. High rates of OTR allow teachers to create safe and predictable learning environments that foster increased student engagement, active student participation, and consequently a reduction in inappropriate student behaviors. The study is being conducted by a research team in the Department of Special Education and Child Development at the University of North Carolina at Charlotte. I understand that 3-4 teachers and 3-4 students per teacher will participate in the project.

The research team will support the virtual delivery of schoolwide professional development about OTR to teachers. Afterwards, data will be collected to select teachers who will receive individualized or targeted coaching support and feedback based on the needs of the individual teachers. Targeted teachers will be observed virtually to determine the effects of tiered coaching on their implementation fidelity of OTR within daily direct instruction. Students will be observed virtually to see if their academic engagement is affected. The initial schoolwide training session will be conducted virtually and last approximately 30 minutes, and the individualized coaching (if needed) will include virtual 3- to 5-minute sessions following observations with a virtual weekly consultation meeting lasting no more than 10 minutes, whereas the targeted coaching (if needed) will include a virtual weekly consultation meeting lasting no more than 10 minutes.

This project is to support teachers who are experiencing classroom problem behaviors as a result of low student engagement. The overarching goal is to increase student engagement and to provide teachers with a high-leverage, low tech universal classroom management practice to assist them with this endeavor. I look forward to the implementation of this project in my school.

Sincerely,

Dr. Carlos Grant, Principal
Wade Hampton High School

APPENDIX C
Recruitment Meeting Script- Instructional Coach

The researcher will cover the following throughout the interview/meeting:

Reason for meeting:
"My name is Holly Johnson, and I am part of a research team in the Department of Special Education and Child Development at the University of North Carolina at Charlotte. I have asked to meet with you today to discuss your potential participation in a study that we are conducting."

Purpose of study:
"I would like to explain the purpose of the study. I am interested in evaluating effects of multilevel training and coaching support on teachers' use of a trained classroom management skill, known as opportunities to respond (OTR), during daily instruction. Specifically, we would like to examine the effects of teachers' implementation of OTR on active student engagement and the effects of multilevel coaching support on teacher implementation fidelity.

If you agree to participate, your role will include:
1. Participating in a virtual training on OTR and how to implement this classroom management practice with fidelity (25 minutes)
2. Delivering a virtual schoolwide training on OTR for instructional staff (30 minutes)
3. Delivering a virtual video conference (15 minutes) for participating teachers regarding data collection procedures and use of electronic platforms
4. Supporting teachers in video recording implementation of OTR during daily teacher-directed instruction (5-10 minutes)
5. Participating in virtual coaching sessions (duration [3-10 minutes per session] and frequency [1-3 times a week] will depend on level of support)
6. Collecting teacher and student data three times a week using GoReact during teacher-delivered instructional session (10 minutes)
7. Completing a short social validity survey at the end of the study (10 minutes)

Researcher will ask the potential participant to confirm whether he/she is interested in participating.

Participation and consent:
"Before you make a decision, I would like to review with you the informed consent which provides important information to potential participants." Researcher will review each section of the Informed Consent (Appendix E) with the instructional coach. "Please take some time to review the informed consent document and to determine whether you would like to participate in the study. I am available to answer any questions you might have either now or later by email or phone. My email is: hjohns76@uncc.edu and my phone number is: 678.773.6473."

APPENDIX D
Recruitment Meeting Script - Teachers

The researcher will cover the following throughout the interview/meeting:

Reason for meeting:
"My name is Holly Johnson, and I am part of a research team in the Department of Special Education and Child Development at the University of North Carolina at Charlotte. I have asked to meet with you today to discuss your potential participation in a study that we are conducting."

Purpose of study:
"I would like to explain the purpose of the study. I am interested in evaluating effects of multilevel training and coaching support on teachers' use of a trained classroom management skill, known as opportunities to respond (OTR), during daily instruction. Specifically, we would like to examine the effects of teachers' implementation of OTR on active student engagement and the effects of multilevel coaching support on teacher implementation fidelity.

If you agree to participate, your role will include:
1. Completing a setting and participant information form (10 minutes)
2. Participating in a virtual schoolwide training on OTR (30 minutes)
3. Participating in a virtual video conference (15 minutes) to receive information on data collection procedures and use of electronic platforms
4. Video recording implementation of OTR during daily teacher-directed instruction (5-10 minutes)
5. Participating in virtual coaching sessions (duration [3-10 minutes per session] and frequency [1-3 times a week] will depend on level of support)
6. Completing a short social validity survey at the end of the study (10 minutes)

Researcher will ask the potential participant to confirm whether he/she is interested in participating.

Participation and consent:
"Before you make a decision, I would like to review with you the informed consent which provides important information to potential participants." Researcher will review each section of the Informed Consent (Appendix F) with the teachers. "Please take some time to review the informed consent document and to determine whether you would like to participate in the study. I am available to answer any questions you might have either now or later by email or phone. My email is: hjohns76@uncc.edu and my phone number is: 678.773.6473."

APPENDIX E-1
Instructional Coach Consent Email

[Date]

Dear Sir or Madam,

I am writing to request your participation in a research study I am conducting as part of a research project at the University of North Carolina at Charlotte. The purpose of this study is to investigate the effects of multileveled training and coaching support on teachers' use of a trained classroom management strategy (i.e., opportunities to respond [OTR]) during daily instruction. The results of this study will be used to examine the effects of teachers' implementation of OTR on active student engagement for high school students.

In this study, school staff will be trained in delivering increased rates of OTR, a common classroom management strategy that is used to increase academic engagement and decrease inappropriate classroom behaviors during teacher-directed instruction. Based on teachers' delivery rates of OTR, teachers may be asked to participate in virtual coaching sessions based on data-decision rules that will be audio and video recorded. Please see the [included/attached] Instructional Coach Consent Form for additional information related to the study.

Due to restrictions presented by COVID-19, the consent process for this study will be fully electronic. Should you have any questions regarding the study, your role, and/or your participation, I can be reached electronically through phone (678.773.6473), email (hjohns76@uncc.edu), or video conference.

Thank you for your time.

Sincerely,

Holly N. Johnson
Doctoral Candidate
Department of Special Education and Child Development
University of North Carolina at Charlotte
9201 University City Blvd
Charlotte, NC 28223

APPENDIX E-2
Instructional Coach Consent Form

![UNC Charlotte logo - Cato College of Education]

Department of Special Education and Child Development
9201 University City Blvd, Charlotte, NC 28223-0001
t/ 704.687.8828 f/ 704.687.1625 www.uncc.edu

<u>Instructional Coach Consent to Participate in a Research Study</u>

Title of the Project: Effects of Multileveled Coaching on Teachers' Implementation of
Opportunities to Respond
Principal Investigator: Holly Johnson, M.A.T., University of North Carolina at Charlotte
Co-investigator: Dr. Ya-yu Lo, Ph.D., University of North Carolina at Charlotte

You are invited to participate in a research study. Participation in this research study is
voluntary. The information provided is to help you decide whether or not to participate. If you
have any questions, please ask.

<u>Important Information You Need to Know</u>
- The purpose of this study is to use high rates of opportunities to respond (OTR) to
  increase active student engagement during teacher-directed instruction.
- You are being asked to participate because you have been recommended by your
  principal to serve as an instructional coach for teachers who have been selected to
  participate in this study.
- As a coach, you are being asked to (a) participate in a 25-minute virtual training on OTR
  and how to implement this classroom management practice with fidelity, (b) deliver a 30-
  minute virtual schoolwide training on OTR for instructional staff, (c) deliver a 15-minute
  virtual video conference to participating teachers on data collection procedures and use of
  electronic platforms, (d) provide virtual targeted and individualized coaching support to
  teachers based on implementation data, and (e) actively support in data collection two to
  three times a week during a 5- to 10-minute teacher delivered instructional session. At the
  end of the study, you also will be asked to complete a short (e.g., 10 minutes) social
  validity survey.
- Due to restrictions presented by COVID-19, the consent process for this study will be
  fully electronic. Should you have any questions, a member from the research team can be
  reached electronically through phone, email, or video conference.
- Please read this form and ask any questions you may have before you decide whether to
  participate in this research study.

Why are we doing this study?
The purpose of this study is to investigate the effects of multilevel training and coaching support on teachers' use of a trained classroom management strategy (i.e., OTR) during daily instruction. Additionally, this study aims to examine the effects of teachers' implementation of OTR on active student engagement for high school students.

Why am I being asked to be in this research study?
You are being asked to participate because you have been recommended by your principal to serve as an instructional coach for teachers who have been selected to participate in this study.

What will teachers and students do in this study? What is my role?
This study will involve teacher implementation of increased OTR during a selected block of direct instruction. Students' active engagement will be monitored during the selected time using direct observation.

If you agree to participate, your role will include:
1. Meet virtually with a member of the research team to provide demographic information about yourself.
2. Participate in a 25-minute virtual training on OTR with the principal investigator (Holly Johnson).
3. Deliver a 30-minute virtual schoolwide training on OTR.
4. Deliver a 15-minute virtual video conference for participating teachers regarding data collection procedures and the use of electronic platforms.
5. Assist in monitoring teacher participants' delivery of OTR and student participants' active engagement using GoReact during a selected teacher-directed instructional period (i.e., 5-10 minutes) three times a week per participant.
6. Provide 3- to 10-minute coaching sessions 1-3 times a week per teacher participant for no more than 5 teachers based on pre-determined data-decision rules.
7. Complete a short (e.g., 10 minutes) social validity survey at the end of the study.

Training and coaching sessions will be video, and audio recorded so that I can collect and analyze the data and ensure the quality of the training and the quality of the intervention. There is nothing you will need to do differently as a result of being audiotaped or videotaped. All information will be kept confidential. I may use segments from the audiotapes and videotapes to demonstrate the effects of the intervention to other research team members or staff at the school. All identifying information will be removed. No one other than myself or members of the research team will be able to identify you. The audiotapes and videotapes may be used for teacher training and educational purposes, if you provide permission.

What benefits might teachers and students experience?
Although there is no guaranteed benefit, participation in this study may include improved teachers' use of OTR, improved student academic engagement, increased instructional time, and decreases in disruptive behaviors within the academic setting. Additionally, findings from this study may benefit students with and without disabilities as we better understand how to support implementation fidelity of evidence-based classroom management strategies.

You also may gain knowledge of strategies to help support teachers and students in increasing active student engagement during direct instruction.

What risks might I experience?
There are minimal risks to participate in this study. Potential, but rare, risks of this study include emotional distress, embarrassment, and loss of confidentiality. To minimize the potential risk associated with this study, the intervention will be embedded into the school's existing culture of continuous improvement, where coaching is already provided by systems-level personnel on a regular basis to school-based staff based on instructional data-decision rules. Furthermore, the researcher will minimize risks associated with this study by keeping inclusion criteria confidential, providing participants with a consent process that effectively communicates what the study entails and enables participants to make the decision that is best for them, and protect data through storage methods only accessible with Niner Credentials (University Dropbox and Canvas). All hard copy data will be stored in a separate locked cabinet from consent forms and any identifying information will be redacted from video- and audio-recording transcripts.

How will information be protected?
We will not use your name. Instead, we will use a pseudonym (fake name). Video recordings will be shared with the research team and used for training other teachers in the future, if you provide permission. Paper materials will be stored in a locked filing cabinet and electronic materials will be stored in a University password-protected Dropbox folder that the researcher team can access. Only the research team will have routine access to the study information. Other people with approval from the Investigator may need to see the information we collect, including people who work for UNC Charlotte and other agencies as required by law or allowed by federal regulations.

How will information be used after the study is over?
We may use the video and audio recordings after the study is over to train others as part of a professional development training for teachers, systems level personnel, and college students. The video and audio recordings will only be used in these professional settings. The data may be shared through publication of our results. The data shared for publication will NOT include information that could identify you, the teachers, and students.

Will I receive an incentive for taking part in this study?
You will receive a $100.00 e-gift card for your participation at the completion of the study. *Incentive payments are considered taxable income. Therefore, we are required to give the University's Financial Services division a log/tracking sheet with the names of all individuals who received a gift card. This sheet is for tax purposes only and is separate from the research data, which means the names will not be linked to study data.*

What other choices are there if I don't want to take part in this study?
If you decline participation or choose to stop, you, participating teachers and students will not be penalized, and you will not lose any benefits to which you are otherwise entitled.

What are my rights if I take part in this study?
Participating in this study is voluntary. Even if you decide to be part of the study now, you may change your mind and stop your participation at any time. You, teachers, and the students will not lose any benefits to which you are entitled.

Who can answer my questions about this study and participant rights?
For questions about this research, you may contact Holly Johnson at 678.773.6473 or hjohns76@uncc.edu or Dr. Ya-yu Lo (responsible faculty) at 704.687.8716 or ylo1@uncc.edu.

If you have questions about research participant's rights, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the Office of Research Compliance at 704.687.1871 or uncc-irb@uncc.edu.

Instructional Coach Consent
By signing this document, you are agreeing to participate in this study. Make sure you understand what the study is about before you sign. You will receive a copy of this document for your records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.

I understand what the study is about, and my questions so far have been answered.

I consent to my participation in "Effects of Multileveled Coaching on Teachers' Implementation of Opportunities to Respond": _____ Yes _____No

I consent to the use of audio and video recordings in the study: _____ Yes _____No (Please see a separate audiotape/videotape consent form)

_____
Participant Name (PRINT)

_____
Signature   Date

_____
Name and Signature of person obtaining consent   Date

APPENDIX F-1
Teacher Consent Email

[Date]

Dear Sir or Madam,

I am writing to request your participation in a research study I am conducting as part of a research project at the University of North Carolina at Charlotte. The purpose of this study is to investigate the effects of multileveled training and coaching support on teachers' use of a trained classroom management strategy (i.e., opportunities to respond [OTR]) during daily instruction. The results of this study will be used to examine the effects of teachers' implementation of OTR on active student engagement for high school students.

In this study, school staff will be trained in delivering increased rates of OTR, a common classroom management strategy that is used to increase academic engagement and decrease inappropriate classroom behaviors, during teacher-directed instruction. Based on teachers' delivery rates of OTR, teachers may be asked to participate in virtual coaching sessions based on data-decision rules that will be audio and video recorded. Please see the [included/attached] Teacher Consent Form for additional information related to the study.

Due to restrictions presented by COVID-19, the consent process for this study will be fully electronic. Should you have any questions regarding the study, your role, and/or your participation, I can be reached electronically through phone (678.773.6473), email (hjohns76@uncc.edu), or video conference.

Thank you for your time.

Sincerely,

Holly N. Johnson
Doctoral Candidate
Department of Special Education and Child Development
University of North Carolina at Charlotte
9201 University City Blvd
Charlotte, NC 28223

APPENDIX F-2
Teacher Consent Form

UNC CHARLOTTE
Cato College of Education

Department of Special Education and Child Development
9201 University City Blvd, Charlotte, NC 28223-0001
t/ 704.687.8828 f/ 704.687.1625 www.uncc.edu

<u>Teacher Consent to Participate in a Research Study</u>

Title of the Project: Effects of Multileveled Coaching on Teachers' Implementation of
Opportunities to Respond
Principal Investigator: Holly Johnson, M.A.T., University of North Carolina at Charlotte
Co-investigator: Dr. Ya-yu Lo, Ph.D., University of North Carolina at Charlotte

You are invited to participate in a research study. Participation in this research study is
voluntary. The information provided is to help you decide whether or not to participate. If you
have any questions, please ask.

<u>Important Information You Need to Know</u>
- The purpose of this study is to use high rates of opportunities to respond (OTR) to
  increase active student engagement during teacher-directed instruction.
- You are being asked to participate in this study based on meeting participant pre-
  qualifications (high school teacher and principal recommendation).
- You will be asked to participate in a virtual schoolwide training and data collection
  session, incorporate OTR during daily instruction, demonstrate the use of OTR during
  recorded observation sessions, and potentially participate in virtual coaching sessions
  based on data-decision rules that will be audio and video recorded.
- Due to restrictions presented by COVID-19, the consent process for this study will be
  fully electronic. Should you have any questions, a member from the research team can be
  reached electronically through phone, email, or video conference.
- Please read this form and ask any questions you may have before you decide whether to
  participate in this research study.

<u>Why are we doing this study?</u>
The purpose of this study is to investigate the effects of multileveled training and coaching
support on teachers' use of a trained classroom management strategy (i.e., OTR) during daily
instruction. Additionally, this study aims to examine the effects of teachers' implementation of
OTR on active student engagement for high school students.

<u>Why am I being asked to be in this research study?</u>
You are being asked to be in this study because you meet participant pre-qualifications (high
school teacher and principal recommendation).

What will students do in this study? What is my role?
This study will involve teacher implementation of increased OTR during a selected block of direct instruction. Students' active engagement will be monitored during the selected time using direct observation.

If you agree to participate, your role will include:
1. Meet (virtually) with a member of the research team to provide demographic information about you and your classroom.
2. Participate in a virtual 30-minute schoolwide training on OTR.
3. Participate in a virtual 15-minute video conference regarding data collection procedures and the use of electronic platforms.
4. Deliver instruction using a variety of OTR and videotape instructional sessions using GoReact.
5. If selected for the study, participate in collaborative virtual coaching sessions using GoReact with the school-based instructional coach. (Number of coaching sessions and duration will be based on predetermined data-decision rules.)
6. Complete a short (e.g., 10 minutes) social validity survey at the end of the study.

The training and coaching sessions will be video, and audio recorded so that I can collect and analyze the data and ensure the quality of the training and of the intervention. There is nothing you will need to do differently as a result of being videotaped or audiotaped. All information will be kept confidential. I may use segments from the videotapes and audiotapes to demonstrate the effects of the intervention to other research team members or staff at the school. All identifying information will be removed. No one other than myself or members of the research team will be able to identify you. The videotapes and audiotapes may be used for teacher training and educational purposes, if you provide permission.

What benefits might students experience?
Although there is no guaranteed benefit, your students may increase their active engagement during direct instruction and as a result, experience increased academic and behavioral achievement. Additionally, findings from this study may benefit your student and other students with and without disabilities as we better understand how to support implementation fidelity of evidence-based classroom management strategies. You may gain knowledge of strategies to help increase students' active engagement during teacher-directed instruction.

What risks might I experience?
There are minimal risks to participate in this study. Potential, but rare, risks of this study include emotional distress, embarrassment, and loss of confidentiality. To minimize the potential risk associated with this study, the intervention will be embedded into the school's existing culture of continuous improvement, where coaching is already provided by systems-level personnel on a regular basis to school-based staff based on instructional data-decision rules. Furthermore, the researcher will minimize risks associated with this study by keeping inclusion criteria confidential, providing participants with a consent process that effectively communicates what the study entails and enables participants to make the decision that is best for them, and protect data through storage methods only accessible with Niner Credentials (University Dropbox and

Canvas). All hard copy data will be stored in a separate locked cabinet from consent forms and any identifying information will be redacted from video- and audio-recording transcripts.

How will information be protected?
We will not use your name. Instead we will use a pseudonym (fake name). Video and audio recordings will be shared with the research team and used for training other teachers in the future, if you provide permission. Paper materials will be stored in a locked filing cabinet and electronic materials will be stored in a University password-protected Dropbox folder that the researcher team can access. Only the research team will have routine access to the study information. Other people with approval from the Investigator may need to see the information we collect, including people who work for UNC Charlotte and other agencies as required by law or allowed by federal regulations.

How will information be used after the study is over?
We may use the video and audio recordings after the study is over to train others as part of a professional development training for teachers, systems level personnel, and college students. The video and audio recordings will only be used in these professional settings. The data may be shared through publication of our results. The data shared for publication will NOT include information that could identify you and your students.

Will I receive an incentive for taking part in this study?
You will receive a $100.00 e-gift card for your participation at the completion of the study. *Incentive payments are considered taxable income. Therefore, we are required to give the University's Financial Services division a log/tracking sheet with the names of all individuals who received a gift card. This sheet is for tax purposes only and is separate from the research data, which means the names will not be linked to study data.*

What other choices are there if I don't want to take part in this study?
If you decline participation or choose to stop, you and your students will not be penalized, and you will not lose any benefits to which you are otherwise entitled.

What are my rights if I take part in this study?
Participating in this study is voluntary. Even if you decide to be part of the study now, you may change your mind and stop your participation at any time. You and your students will not lose any benefits to which you are entitled.

Who can answer my questions about this study and participant rights?
For questions about this research, you may contact Holly Johnson at 678.773.6473 or hjohns76@uncc.edu or Dr. Ya-yu Lo (responsible faculty) at 704.687.8716 or ylo1@uncc.edu.

If you have questions about research participant's rights, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the Office of Research Compliance at 704.687.1871 or uncc-irb@uncc.edu.

<u>Teacher Consent</u>
By signing this document, you are agreeing to participate in this study. Make sure you understand what the study is about before you sign. You will receive a copy of this document for your records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.

I understand what the study is about, and my questions so far have been answered.

I consent to my participation in "Effects of Multileveled Coaching on Teachers' Implementation of Opportunities to Respond": _____ Yes _____No

I consent to the use of video and audio recordings in the study: _____ Yes _____No (Please see a separate videotape and audiotape consent form)

_____
Participant Name (PRINT)

_____
Signature   Date

_____
Name and Signature of person obtaining consent   Date

APPENDIX G
Multi Use Video/Audio Release Form (Adult)

I hereby consent and agree to be photographed, audio recorded, and/or videotaped during instructional delivery and coaching sessions by the University of North Carolina at Charlotte (herein "UNC Charlotte") or anyone authorized by UNC Charlotte, including but not limited to Principal Investigators and researchers (herein "Agents"), during my participating in the research study " The Effects of Multileveled Coaching on Teachers' Implementation of Opportunities to Respond" (herein "Research"). I give permission to UNC Charlotte and its Agents to use or reproduce any such videos or recordings for the following purposes (initial):

_____ Scholarship and the dissemination of research findings; and/or

_____ Classroom and professional training and education.

I agree that the use herein may be without compensation. I hereby waive any right to inspect or approve the finished recordings and expressly release UNC Charlotte and its Agents, from any and all claims which I may have for invasion of privacy, right of publicity, defamation, copyright infringement, or any other causes of action arising out of the use, adaptation, reproduction, distribution, broadcast, or exhibition of such photographs or video recordings.

I understand that my name <u>will not</u> be associated with the any videos or recordings and that all recordings will be maintained in compliance with University Policies on Records Management, Retention, and Disposition. I further understand that I have the right to revoke this permission, which must be in writing. However, any such revocation shall not affect disclosures or publications previously made by UNC Charlotte and its Agents prior to the receipt of such written revocation.

**I HAVE READ THIS AGREEMENT, I UNDERSTAND IT AND
I AGREE TO BE BOUND BY IT.**

_____   _____
(Signature)   (Date)

_____
(Printed Name)

APPENDIX H
Setting and Participant Information Form

Name: _____ Date: _____

Please respond to the following items about <u>yourself</u>:

1. Role:
   ☐ General education teacher
   ☐ Special education teacher
   ☐ Teaching assistant (i.e., paraprofessional, classroom aide)
   ☐ Other (please indicate) _____

2. Years in role: _____ Total number of years in teaching _____

3. Gender:
   ☐ Female
   ☐ Male
   ☐ Other (please indicate) _____

4. Age: _____

5. Race:
   ☐ White
   ☐ Black or African American
   ☐ American Indian or Alaska Native
   ☐ Asian
   ☐ Native American or Other Pacific Islander
   ☐ Other (please indicate) _____
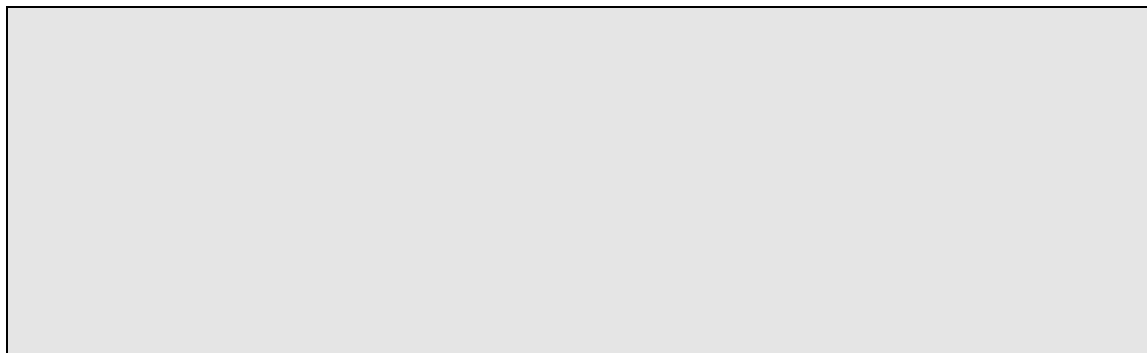
6. Ethnicity:
   ☐ Hispanic or Latino
   ☐ Not Hispanic or Latino
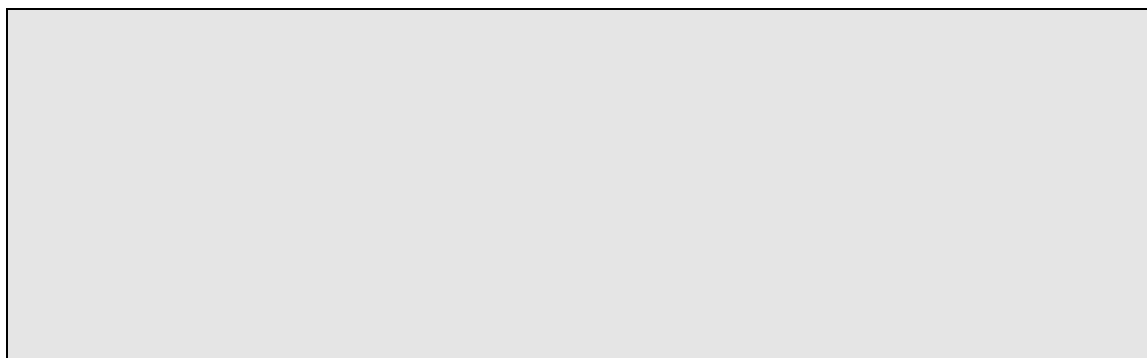
7. Education (check all that apply):
   ☐ No high school degree or GED
   ☐ High school degree or GED
   ☐ Some college
   ☐ Associate degree (2 years)
   ☐ Bachelor of Art/Bachelor of Science degree (4 years)
   ☐ Graduate work or degree
   ☐ Other (please indicate) _____
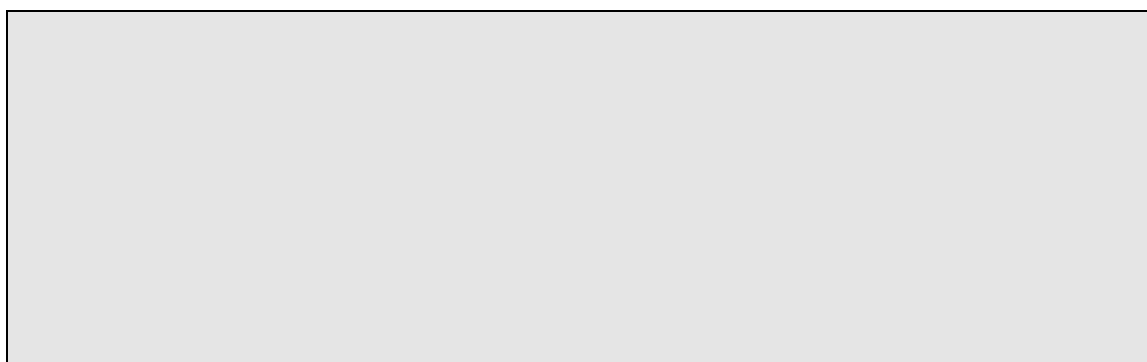
8. Please list the type of teaching license and endorsement(s)/certification(s), if any, you currently hold in the state of South Carolina.

9. Please describe the strategies that you have used to <u>increase</u> student engagement during times of instructional delivery.

10. Please describe any training you have received to increase active student engagement during instruction.

Setting and Participant Information Form, continued

Please respond to the following items about the students in your classroom:

1. Age
   o Age range: _____
   o Age mean: _____

2. Total number of students: _____

3. Gender
   o Number of females: _____
   o Number of males: _____

4. Race

Race	Number of students
White	
Black or African American	
American Indian or Alaska Native	
Asian	
Native Hawaiian or Other Pacific Islander	
Other	

5. Please describe anything not covered above that might be important to know about your classroom or students in your classroom.

APPENDIX I-1
Parent or Legal Guardian Consent Email

[Date]

Dear Sir or Madam,

Your child/legal ward is invited to participate in a voluntary research study as part of a research project I am conducting at the University of North Carolina at Charlotte. The purpose of this study is to find out if using high rates of opportunities to respond (OTR) will increase active student engagement during teacher-directed instruction. The results of this study will be used to examine the effects of teachers' implementation of OTR on active student engagement for high school students.

In this study, your child/legal ward will be asked to participate in daily instruction lessons that will be delivered by his/her teacher during regularly scheduled instructional times. The lesson will incorporate a variety of OTR at an increased rate during teacher-directed instruction.

Your child's instructional sessions will be audio and video recorded so that I can collect and analyze the data and ensure the quality of the intervention. There is nothing your child/legal ward will need to do differently as a result of being videotaped or audiotaped. All information will be kept confidential. Please see the [included/attached] Parental/Legal Guardian Consent Form for additional information related to the study.

Due to restrictions presented by COVID-19, the consent and student assent process for this study will be fully electronic. Should you have any questions regarding the study and/or your child's/legal ward's participation, I can be reached electronically through phone (678.773.6473), email (hjohns76@uncc.edu), or video conference.

Thank you for your time.

Sincerely,

Holly N. Johnson
Doctoral Candidate
Department of Special Education and Child Development
University of North Carolina at Charlotte
9201 University City Blvd
Charlotte, NC 28223

APPENDIX I-2
Parent or Legal Guardian Consent Form

Department of Special Education and Child Development
9201 University City Blvd, Charlotte, NC 28223-0001
t/ 704.687.8828 f/ 704.687.1625 www.uncc.edu
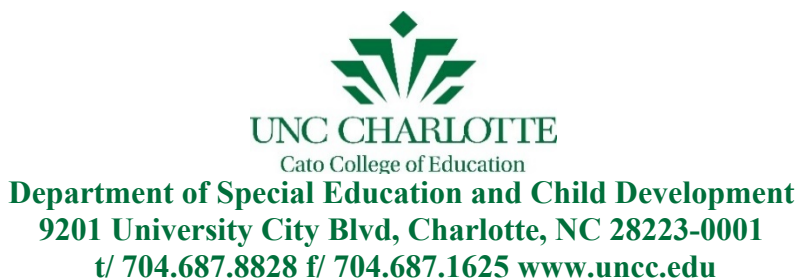
Parent or Legal Guardian Consent for Child/Minor Participation in Research

Title of the Project: Effects of Multileveled Coaching on Teachers' Implementation of Opportunities to Respond
Principal Investigator: Holly Johnson, M.A.T., University of North Carolina at Charlotte
Co-investigator: Dr. Ya-yu Lo, Ph.D., University of North Carolina at Charlotte

Your child/legal ward is invited to participate in a research study. Your child's/legal ward's participation in this research study is voluntary. The information provided is to help you decide whether or not to allow your child/legal ward to participate. If you have any questions, please ask.

Important Information You Need to Know
- The purpose of this study is to find out if using high rates of opportunities to respond (OTR) will increase active student engagement during teacher-directed instruction.
- Your child/legal ward may participate in this study if he or she is a student in ninth through twelfth grades at [SCHOOL NAME]. Children in this study will be in their normal classroom with their teacher. The teacher will be trained by a school-based instructional coach to use a variety of OTR (i.e., verbal, written, gestural, mixed) at high rates (i.e., $3 \geq$ OTR) during teacher-directed instruction. Teachers can use high rates of OTR to increase student engagement, as a formative assessment of learning, and to help support classroom management.
- Instructional sessions will be video and audio recorded; therefore, your child's participation in instruction may be captured in those recordings.
- We do not believe that your child/legal ward will experience any risk from participating in this study. The delivery of OTR will occur during normal class time as a part of lessons that North Carolina teachers are required to teach. Your child/legal ward may benefit from the increase in OTR during direct instruction, but we cannot say this for sure. The information we learn may help us learn how to support teachers in delivering effective instruction that increases student engagement.
- Your child/legal ward will still take part in normal classroom learning and activities, even if you decide to not let them participate in this study.
- Due to restrictions presented by COVID-19, the consent process for this study will be fully electronic. Should you have any questions, a member from the research team can be reached electronically through phone, email, or video conference.

- Please read this form and ask any questions you may have before you decide whether to allow your child/legal ward to participate in this research study.

Why are we doing this study?
The purpose of this study is to investigate the effects of multileveled training and coaching support on teachers' use of a trained classroom management strategy (i.e., OTR) during daily instruction. Additionally, this study aims to examine the effects of teachers' implementation of OTR on active student engagement for high school students.

Why is your child/legal ward being asked to be in this research study?
You are being asked to allow your child/legal ward to participate in this study because he or she is in ninth through twelfth grade at [NAME OF SCHOOL].

What will children do in this study?
Your child/legal ward will be asked to participate in daily instruction lessons that will be delivered by his/her teacher during regularly scheduled instructional times. The lesson will incorporate a variety of OTR at an increased rate during teacher-directed instruction. Student engagement during this time will be collected on Teacher/Student Observation Forms.

Your child's instructional sessions will be audio and video recorded so that I can collect and analyze the data and ensure the quality of the intervention. There is nothing your child/legal ward will need to do differently as a result of being videotaped or audiotaped. All information will be kept confidential. I may use segments from the videotapes and audiotapes to demonstrate the effects of the intervention to other research team members or staff at the school. All identifying information will be removed. No one other than myself or members of the research team will be able to identify your child/legal ward. The videotapes and audiotapes may be used for teacher training and educational purposes, if you provide permission.

What benefits might children experience?
The benefits of participation in this study are providing your child with a variety of increased OTR within the general education classroom during regularly scheduled instructional times. Although there is no guaranteed benefit, participation in this study may include improved student academic engagement, increased instructional time, and decreases in disruptive behaviors within the academic setting.

What risks might children experience?
We do not believe that there are any risks to your child/legal ward because this study will occur as part of routine classroom teaching.

How will information be protected?
We will not use your child's/legal ward's name. Instead we will use a pseudonym (fake name). Paper materials will be stored in a locked filing cabinet and electronic materials will be stored in a University Dropbox folder that the researcher team can access. Only the research team will have routine access to the study information. Other people with approval from the Investigator may need to see the information we collect, including people who work for UNC Charlotte and other agencies as required by law or allowed by federal regulations.

How will information be used after the study is over?
After this study is complete, study data may be shared with other researchers for use in other studies without asking for consent again or as may be needed as part of publishing our results. The data we share will NOT include information that could identify your child.

Will my child/legal ward receive an incentive for taking part in this study?
Your child/legal ward will not receive any payment for being in this study.

What other choices are there if I don't want my child/legal ward to take part in this study?
If you decide not to let your child/legal ward take part in this study, he/she will still take part in the routine classroom activities as he/she would on a normal day. The classroom teacher will still teach all students the daily lessons.

What are my child's/legal ward's rights if they take part in this study?
Participating in this study is voluntary. Even if you decide to allow your child/legal ward to be part of the study now, you may change your mind and stop his/her participation at any time. You and your child/legal ward will not lose any benefits to which you are entitled.

Who can answer my questions about this study and participant rights?
For questions about this research, you may contact Holly Johnson at 678.773.6473 or hjohns76@uncc.edu or Dr. Ya-yu Lo (responsible faculty) at 704.687.8716 or ylo1@uncc.edu.

If you have questions about research participant's rights, or wish to obtain information, ask questions, or discuss any concerns about this study with someone other than the researcher(s), please contact the Office of Research Compliance at 704.687.1871 or uncc-irb@uncc.edu.

Parent or Legally Authorized Representative Consent
By signing this document, you are agreeing to your child's/legal ward's participation in this study. Make sure you understand what the study is about before you sign. You will receive a copy of this document for your records. If you have any questions about the study after you sign this document, you can contact the study team using the information provided above.

I understand what the study is about, and my questions so far have been answered. I agree for my child/legal ward to take part in this study.

I consent to my child's/legal ward's participation in "Effects of Multileveled Coaching on Teachers' Implementation of Opportunities to Respond": _____ Yes _____No

I consent to the use of video and audio recordings in the study: _____ Yes _____No (Please see a separate videotape and audiotape consent form)

_____
Participant Name (PRINT)

_____

Parent/Legally Authorized Representative Name and Relationship to Participant (PRINT)

_____

Signature   Date

_____

Name and Signature of person obtaining consent   Date

APPENDIX J
Student Assent Form

UNC CHARLOTTE
Cato College of Education

Department of Special Education and Child Development
9201 University City Blvd, Charlotte, NC 28223-0001
t/ 704.687.8828 f/ 704.687.1625 www.uncc.edu
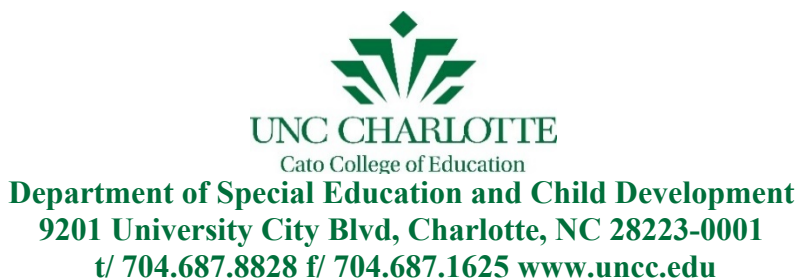
<u>Student Assent</u>
Effects of Multilevel Coaching on Teachers' Implementation of
Opportunities to Respond

Dear _____ (Student):

My name is Ms. Holly Johnson. I am a doctoral student and researcher at The University of North Carolina at Charlotte. I am working on a study to see if teachers' use of high rates of opportunities to respond during teacher-directed instruction has a positive effect on students' active engagement in class.

Your teacher will be trained to include a variety of opportunities to respond into his/her daily lesson plans. Someone from your school and I will be observing video recordings of students throughout the week to see if students' level of academic engagement increases as your teacher provides instruction. At the end of the study, I will ask you some questions about the lessons. If at any time, you decide that you no longer want to participate in the study, you can stop, and no one will be upset with you.

I hope this study will help students improve their academic engagement and decrease undesirable behaviors during teacher-directed instruction. However, we have to conduct this study to see if this is true. When we are finished, I will write a report, but no identifying information will be included in the report.

If you want to participate in this study, please sign your name below.

_____   _____
Student Signature   Date

_____   _____
Experimenter Signature   Date

APPENDIX K
Teacher's Implementation of OTR Fidelity Checklist and Student Observation Form

Date: _____ Teacher: _____ Observation Period: _____

Behavior Definition:
Teacher: Opportunity to respond (OTR) is defined as the teacher providing the group or class with an OTR to a question or request that is verbal, gestural, and/or written.

Student: Student engagement is defined as students actively participating in classroom activity (i.e., writing, raising hand, answering a question [choral response], talking about a lesson, interacting with a peer as directed).

Interval	Did the teacher …						
0'01"-1'00"	1. Maintain an instructional pace that includes each of the delivery skills in each trial? I = Input P/Q = Prompt/Question M/F = Monitor/Feedback						**# of Yes** _____
	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	**# of OTR**
	2. Use OTR that emphasized union responding during each instructional trial? Types of OTR used: V = verbal G= gesture W= written						_____ **# of Yes**
	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	_____
Student A	Y N	Y N	Y N	Y N	Y N	Y N	
Student B	Y N	Y N	Y N	Y N	Y N	Y N	
Student C	Y N	Y N	Y N	Y N	Y N	Y N	
Student D	Y N	Y N	Y N	Y N	Y N	Y N	
1'01"-2'00"	3. Maintain an instructional pace that includes each of the delivery skills in each trial? I = Input P/Q = Prompt/Question M/F = Monitor/Feedback						**# of Yes** _____
	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	**# of OTR**
	4. Use OTR that emphasized union responding during each instructional trial? Types of OTR used: V = verbal G= gesture W= written						_____ **# of Yes**
	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	_____
Student A	Y N	Y N	Y N	Y N	Y N	Y N	
Student B	Y N	Y N	Y N	Y N	Y N	Y N	
Student C	Y N	Y N	Y N	Y N	Y N	Y N	
Student D	Y N	Y N	Y N	Y N	Y N	Y N	
2'01"-3'00"	5. Maintain an instructional pace that includes each of the delivery skills in each trial? I = Input P/Q = Prompt/Question M/F = Monitor/Feedback						**# of Yes** _____
	Yes No	Yes No	Yes No	Yes No	Yes No	Yes No	

	I P/Q M/F	I P/Q M/F	I P/Q M/F	I P/Q M/F	I P/Q M/F	I P/Q M/F	**# of OTR** _____
	6. Use OTR that emphasized union responding during each instructional trial? Types of OTR used: V = verbal G= gesture W= written						**# of Yes** _____
	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	
Student A	Y N	Y N	Y N	Y N	Y N	Y N	
Student B	Y N	Y N	Y N	Y N	Y N	Y N	
Student C	Y N	Y N	Y N	Y N	Y N	Y N	
Student D	Y N	Y N	Y N	Y N	Y N	Y N	
3'01"-4'00"	7. Maintain an instructional pace that includes each of the delivery skills in each trial? I = Input P/Q = Prompt/Question M/F = Monitor/Feedback						**# of Yes** _____
	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	**# of OTR** _____
	8. Use OTR that emphasized union responding during each instructional trial? Types of OTR used: V = verbal G= gesture W= written						**# of Yes** _____
	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	
Student A	Y N	Y N	Y N	Y N	Y N	Y N	
Student B	Y N	Y N	Y N	Y N	Y N	Y N	
Student C	Y N	Y N	Y N	Y N	Y N	Y N	
Student D	Y N	Y N	Y N	Y N	Y N	Y N	
4'01"-5'00"	9. Maintain an instructional pace that includes each of the delivery skills in each trial? I = Input P/Q = Prompt/Question M/F = Monitor/Feedback						**# of Yes** _____
	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	**# of OTR** _____
	10. Use OTR that emphasized union responding during each instructional trial? Types of OTR used: V = verbal G= gesture W= written						**# of Yes** _____
	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	
Student A	Y N	Y N	Y N	Y N	Y N	Y N	
Student B	Y N	Y N	Y N	Y N	Y N	Y N	
Student C	Y N	Y N	Y N	Y N	Y N	Y N	
Student D	Y N	Y N	Y N	Y N	Y N	Y N	
5'01"-6'00"	11. Maintain an instructional pace that includes each of the delivery skills in each trial? I = Input P/Q = Prompt/Question M/F = Monitor/Feedback						**# of Yes** _____
	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	**# of OTR**

								# of Yes
	12. Use OTR that emphasized union responding during each instructional trial? Types of OTR used: V = verbal G= gesture W= written							_____
	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W		_____
Student A	Y N	Y N	Y N	Y N	Y N	Y N		
Student B	Y N	Y N	Y N	Y N	Y N	Y N		
Student C	Y N	Y N	Y N	Y N	Y N	Y N		
Student D	Y N	Y N	Y N	Y N	Y N	Y N		
6'01"-7'00"	13. Maintain an instructional pace that includes each of the delivery skills in each trial? I = Input P/Q = Prompt/Question M/F = Monitor/Feedback							**# of Yes** _____
	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F		**# of OTR**
	14. Use OTR that emphasized union responding during each instructional trial? Types of OTR used: V = verbal G= gesture W= written							_____
	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W		**# of Yes** _____
Student A	Y N	Y N	Y N	Y N	Y N	Y N		
Student B	Y N	Y N	Y N	Y N	Y N	Y N		
Student C	Y N	Y N	Y N	Y N	Y N	Y N		
Student D	Y N	Y N	Y N	Y N	Y N	Y N		
7'01"-8'00"	15. Maintain an instructional pace that includes each of the delivery skills in each trial? I = Input P/Q = Prompt/Question M/F = Monitor/Feedback							**# of Yes** _____
	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F		**# of OTR**
	16. Use OTR that emphasized union responding during each instructional trial? Types of OTR used: V = verbal G= gesture W= written							_____
	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W		**# of Yes** _____
Student A	Y N	Y N	Y N	Y N	Y N	Y N		
Student B	Y N	Y N	Y N	Y N	Y N	Y N		
Student C	Y N	Y N	Y N	Y N	Y N	Y N		
Student D	Y N	Y N	Y N	Y N	Y N	Y N		
8'01"-9'00"	17. Maintain an instructional pace that includes each of the delivery skills in each trial? I = Input P/Q = Prompt/Question M/F = Monitor/Feedback							**# of Yes** _____
	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F		**# of OTR**
	18. Use OTR that emphasized union responding during each instructional trial?							_____

	Types of OTR used: V = verbal G= gesture W= written						# of Yes
	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	_____
Student A	Y N	Y N	Y N	Y N	Y N	Y N	
Student B	Y N	Y N	Y N	Y N	Y N	Y N	
Student C	Y N	Y N	Y N	Y N	Y N	Y N	
Student D	Y N	Y N	Y N	Y N	Y N	Y N	
9'01"- 10'00"	19.Maintain an instructional pace that includes each of the delivery skills in each trial? I = Input P/Q = Prompt/Question M/F = Monitor/Feedback						# of Yes _____
	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	Yes No I P/Q M/F	# of OTR
	20.Use OTR that emphasized union responding during each instructional trial? Types of OTR used: V = verbal G= gesture W= written						_____ # of Yes
	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	Yes No V G W	_____
Student A	Y N	Y N	Y N	Y N	Y N	Y N	
Student B	Y N	Y N	Y N	Y N	Y N	Y N	
Student C	Y N	Y N	Y N	Y N	Y N	Y N	
Student D	Y N	Y N	Y N	Y N	Y N	Y N	
21.Use two (2) or more types (verbal, gesture, writing) of OTR to increase active student engagement during the 10-minute teacher-directed instruction lesson?							Yes No

% of Fidelity = _____(#s of Yes) / _____ (#s of applicable steps) x 100 = _____

22.Meet or exceed a rate three (3) or more OTR per minute?	Yes No

# of OTR _____ / # of min _____ = _____ OTR per min

The instructional session lasted for _____ minutes.

Rate of student engagement = # of OTR / # of min

Student A: (# of OTR _____ / # of min _____) = _____rate of student engagement

Student B: (# of OTR _____ / # of min _____) = _____rate of student engagement

Total: (# of OTR _____ / # of min _____) = _____rate of student engagement

APPENDIX L
Weekly Email Communication

[Greeting],

Just a friendly reminder. The use of high rates of opportunities to respond (OTR) during teacher-directed instruction has been shown to increase active student engagement and improve academic and behavioral outcomes for students.

OTRs invite students to respond through verbal (e.g., answering a question), gestured (e.g., raising their hand if they agree with a statement), or written (e.g., writing a response) formats. OTRs are delivered using the following method: *(1) teacher provides input, (2) students are provided with a specific prompt or question, (3) students are given appropriate time to think and respond, and (4) teacher monitors student responses and provides feedback.*

Our instructional goal is to include at least three (3) OTR per minute with 90% fidelity during teacher-directed instruction. We look forward to seeing a variety of OTR used during your instruction as we continue to visit classrooms. Please let <insert appropriate point of contact here> if you have any questions.

[Closing],

[Signature]

APPENDIX M
Multilevel Professional Development and Coaching Model

```
┌─────────────────────────────────────────────────┐
│                Universal Support                 │
│       (Schoolwide Professional Development)      │
└─────────────────────────────────────────────────┘
                        │
                        ▼
┌─────────────────────────────────────────────────┐
│                Baseline (Post-PD)                │
└─────────────────────────────────────────────────┘
```

At least 90% of steps & ≥ 3 OTR per minute	Below 90% of steps or ≤ 2 OTR per minute	Below 90% of steps or ≤ 2 OTR per minute after 6 sessions	Below 80% of steps or < 1 OTR per minute after 6 sessions
Excluded	**Targeted Coaching Support (Tier 2)**	**Targeted Coaching with Intentional Planning (Tier 2)**	**Individualized Coaching Support (Tier 3)**

3 consecutive sessions with at least 90% of steps & a rate of ≥ 3 OTR per minute

Maintenance

APPENDIX N
Targeted Coaching Consultation Form

Directions: Follow the coaching procedures for each coaching session. Be sure to video record the entire session. At the end of the session, complete the coaching consultation form by indicating whether the coaching procedure was implemented (yes), if the coaching procedure was not implemented (no), or if there was not an opportunity to implement the coaching procedure (no opportunity).

Teacher: **Coaching level:**   **Coaching session #:**
                         Targeted

Date: **Start/end time:**   **Reviewer:**

Coaching procedures:	Yes	No	No opportunity
Implementation Review			
❖ Coach shares number of OTR (total and type)			
❖ Coach shares rate of opportunities to respond and if it met current goal			
❖ Coach identifies focus of coaching session (e.g., use of OTR, delivery skill[s], pacing)			
Instruction			
❖ Coach provides a description of OTR and/or delivery skill(s)			
❖ Coach provides a description of how OTR and/or use of delivery skills are used to increase student engagement			
Feedback			
❖ During or after rehearsal, Coach provides specific positive praise for correct implementation or corrective feedback for incorrect implementation, followed by another opportunity to practice until mastery			
Goal Setting			
❖ Coach provides teacher with an opportunity to set a realistic goal for the following session or week			

Notes from coaching session:

APPENDIX O
Targeted Coaching with Intentional Planning Consultation Form

Directions: Follow the coaching procedures for each coaching session. Be sure to video record the entire session. At the end of the session, complete the coaching consultation form by indicating whether the coaching procedure was implemented (yes), if the coaching procedure was not implemented (no), or if there was not an opportunity to implement the coaching procedure (no opportunity).

Teacher: **Coaching level:**   **Coaching session #:**
                             Targeted w/ Intentional Planning

Date: **Start/end time:**   **Reviewer:**

Coaching procedures:	Yes	No	No opportunity
Implementation Review			
❖ Coach shares number of OTR (total and type)			
❖ Coach shares rate of opportunities to respond and if it met current goal			
❖ Coach identifies focus of coaching session (e.g., use of OTR, delivery skill[s], pacing)			
Instruction			
❖ Coach provides a description of OTR and/or delivery skill(s)			
❖ Coach provides a description of how OTR and/or use of delivery skills are used to increase student engagement			
❖ Coach supports teacher with reviewing an upcoming lesson and intentionally planning OTRs to be included during teacher-directed instruction.			
Feedback			
❖ During or after rehearsal, Coach provides specific positive praise for correct implementation or corrective feedback for incorrect implementation, followed by another opportunity to practice until mastery			
Goal Setting			
❖ Coach provides teacher with an opportunity to set a realistic goal for the following session or week			

Notes from coaching session:

APPENDIX P
Brief Individualized Coaching Consultation Form

Directions: Follow the coaching procedures for each brief coaching session (i.e., either after the class period or before the end of the instructional day). Be sure to audio record the entire session. At the end of the session, complete the coaching consultation form by indicating whether the coaching procedure was implemented (yes), if the coaching procedure was not implemented (no), or if there was not an opportunity to implement the coaching procedure (no opportunity).

Teacher: **Coaching level:**   **Coaching session #:**
                          Individualized

Date: **Start/end time:**   **Reviewer:**

Coaching procedures:	Yes	No	No opportunity
Implementation Review			
❖ Coach shares number of OTR (total and type)			
❖ Coach shares rate of opportunities to respond and if it met current goal			
Instruction			
❖ Coach identifies focus of coaching session (e.g., use of OTR, delivery skill[s], pacing)			
❖ Coach provides a description of OTR and/or delivery skill(s)			
Modeling			
❖ Coach demonstrates a nonexample and an example of OTR and/or delivery skills			
Rehearsal			
❖ Coach facilitates a role-play in which the teacher practices a target behavior related to delivering OTR and/or delivery skill(s)			
Feedback			
❖ During or after rehearsal, Coach provides specific positive praise for correct implementation or corrective feedback for incorrect implementation, followed by another opportunity to practice until mastery			
❖ Coach encourages teacher to ask any questions he/she may have during consultation meeting			

Notes from coaching session:

APPENDIX Q
Weekly/Extended Individualized Coaching Consultation Form

Directions: Follow the coaching procedures for each coaching session. Be sure to audio record the entire session. At the end of the session, complete the coaching consultation form by indicating whether the coaching procedure was implemented (yes), if the coaching procedure was not implemented (no), or if there was not an opportunity to implement the coaching procedure (no opportunity).

Teacher: **Coaching level:**   **Coaching session #:**
Individualized

Date: **Start/end time:**   **Reviewer:**

Coaching procedures:	Yes	No	No opportunity
Implementation Review			
❖ Coach shares number of OTR (total and type)			
❖ Coach shares rate of opportunities to respond and if it met current goal			
Instruction			
❖ Coach identifies focus of coaching session (e.g., use of OTR, delivery skill[s], pacing)			
❖ Coach provides a description of OTR and/or delivery skill(s)			
❖ Coach provides a description of how OTR and/or use of delivery skills are used to increase student engagement			
Modeling			
❖ Coach demonstrates a nonexample and an example of OTR and/or delivery skills			
Rehearsal			
❖ Coach facilitates a role-play in which the teacher practices a target behavior related to delivering OTR and/or delivery skill(s)			
Feedback			
❖ During or after rehearsal, Coach provides specific positive praise for correct implementation or corrective feedback for incorrect implementation, followed by another opportunity to practice until mastery			
❖ Coach encourages teacher to ask any questions he/she may have during consultation meeting			
Goal Setting			
❖ Coach provides teacher with an opportunity to set a realistic goal for the following session or week			

Notes from coaching session:

APPENDIX R
Instructional Coach Training Session Fidelity Checklist

Date: _____   Observer: _____

Did the experimenter…	Rating	
1. Provide a virtual training session to the instructional coach on opportunities to respond (OTR) as an effective classroom management skill?	Yes	No
2. Introduce background research on the use of OTR and its ability to increase active student engagement and reduce classroom disruptive behavior?	Yes	No
3. Provide the coach with a definition and an example of each of the three (3) types of OTR (i.e., verbal, gestural, and written)?	Yes	No
4. Provide the coach with a variety of examples of OTR by type?	Yes	No
5. Engage the coach in providing examples of various OTR?	Yes	No
6. Clearly outline the delivery skills (i.e., *input, question, response, monitor, feedback)* that should be present when using OTR during teacher-directed instruction?	Yes	No
7. Provide the coach with an opportunity to ask questions related to OTR?	Yes	No
8. Give the coach an opportunity to provide feedback based on the training session?	Yes	No
9. Provide the coach with an opportunity to discuss how a virtual professional development session similar to this training may potentially be delivered to schoolwide staff?	Yes	No
10. Provide the coach with the materials needed to deliver a virtual schoolwide professional development session to school staff?	Yes	No
The training session lasted for _____ minutes.		
% of Fidelity = _____(#s of Yes) / _____ (#s of applicable steps) x 100 =		

APPENDIX S
Coach-led Schoolwide Professional Development Fidelity Checklist

Date: _____   Observer: _____

Did the instructional coach…	Rating	
1. Provide a virtual professional development session to schoolwide staff on opportunities to respond (OTR) as an effective classroom management skill?	Yes	No
2. Introduce background research on the use of OTR and its ability to increase active student engagement and reduce classroom disruptive behavior?	Yes	No
3. Provide staff with a definition and an example of each of the three (3) types of OTR (i.e., verbal, gestural, and written)?	Yes	No
4. Clearly outline the delivery skills (i.e., *input, question, response, monitor, feedback)* that should be present when using OTR during teacher-directed instruction?	Yes	No
5. Engage staff in providing examples of various OTR?	Yes	No
6. Provide staff with a variety of examples of OTR by type?	Yes	No
7. Provide the staff with an opportunity to discuss how OTR may be incorporated into their daily instruction?	Yes	No
8. Provide staff with an opportunity to ask questions related to OTR?	Yes	No
9. Give the staff an opportunity to provide feedback based on the professional development session?	Yes	No
10. Encourage staffs' use of OTR following this professional development session?	Yes	No
11. Inform staff that they will be receiving bi-weekly emails as reminders to use high rates of OTR during teacher-directed instruction to increase student engagement?	Yes	No
The schoolwide PD session lasted for _____ minutes.		
% of Fidelity = _____(#s of Yes) / _____ (#s of applicable steps) x 100 =		

APPENDIX T
Experimenter Data Collection Fidelity Checklist

Did the experimenter…	Rating	
1. Provide the coach with all appropriate data collection forms?	Yes	No
2. Provide the coach with a thorough explanation of the data collection forms and how to collect both teacher and student data?	Yes	No
3. Collect interobserver agreement data on at least 30% of teacher observation sessions during the baseline phase?	Yes	No
4. Collect interobserver agreement data on at least 30% of student observation sessions during the baseline phase?	Yes	No
5. Collect interobserver agreement data on at least 30% of teacher observation sessions during the intervention phase?	Yes	No
6. Collect interobserver agreement data on at least 30% of student observation sessions during the intervention phase?	Yes	No
7. Collect interobserver agreement data on at least 30% of targeted coaching sessions during the intervention phase?	Yes	No
8. Collect interobserver agreement data on at least 30% of individualized coaching sessions during the intervention phase?	Yes	No
9. Collect interobserver agreement data on at least 30% of teacher observation sessions during the maintenance phase?	Yes	No
10. Collect interobserver agreement data on at least 30% of student observation sessions during the maintenance phase?	Yes	No
11. Collect generalization data for two (2) sessions per phase during baseline and intervention phases?	Yes	No
12. Collect generalization data one (1) time one (1) month after the conclusion of the intervention?	Yes	No

% of Fidelity = _____(#s of Yes) / _____ (#s of applicable steps) x 100 =

APPENDIX U
Teacher Data Collection Fidelity Checklist

Did the teacher …	Rating	
1. Receive instruction they would need to video record three (3) instructional session a week during baseline, three (3) instructional sessions a week during intervention, two (2) sessions during each phase in an alternative block of instruction, and (1) session 1 week, 1 month, and 2 months after the conclusion of the intervention?	Yes	No
2. Receive training on how to video record instructional sessions and upload the videos to GoReact prior to data collection?	Yes	No
3. Receive training on how to virtually participate in consultation sessions using GoReact?	Yes	No
4. Receive training on how to access virtual feedback using GoReact?	Yes	No
% of Fidelity = _____ (#s of Yes) / _____ (#s of applicable steps) x 100 =		

APPENDIX V
Instructional Coach Data Collection Fidelity Checklist

Did the instructional coach …	Rating	
1. Receive virtual training on data collection forms from the experimenter prior to data collection?	Yes	No
2. Observe and record baseline data twice a week using GoReact for two weeks on teacher behavior?	Yes	No
3. Observe and record baseline data twice a week using GoReact for two weeks on student engagement?	Yes	No
4. Use data-decision rules to determine participants' level of support based on baseline data? • Maintenance: 90% of steps completed and rate of 3 or more OTRs per min during the course of teacher-directed instruction for at least 3 out of 4 baseline sessions – continue data collection and send weekly email • Targeted Coaching Support: Less than 90% of steps completed or rate of fewer than or equal to 2 OTRs per min during the course of teacher-directed instruction – continue data collection, provide brief feedback in the form of virtual annotations on video recordings within GoReact during or following observation sessions, and provide weekly performance feedback (10 min or less consultation) virtually and by email. • Targeted Coaching with Intentional Planning : While receiving targeted coaching support, if 6 consecutive sessions indicate below 90% of steps completed or rate of fewer than 2 OTRs per min during the course of teacher-directed instruction, begin Targeted Coaching with Intentional Planning. Less than 90% of steps completed or rate of fewer than or equal to 2 OTRs per min during the course of teacher-directed instruction – continue data collection, provide brief feedback in the form of virtual annotations on video recordings within GoReact following observation sessions, incorporate an opportunity for teachers to examine lesson plans and intentionally plan OTRs, and provide weekly performance feedback (10 min or less consultation) virtually and by email • Individual Coaching Support: While receiving targeted coaching with additional planning, if 6 consecutive sessions indicate below 80% of steps completed or rate of fewer than 1 OTR per min during the course of teacher-directed instruction – continue data collection, provide brief feedback in the form of virtual annotations on video recordings within GoReact during or following observation sessions, engage in a brief video consultation immediately following the observation session (5 min or less consultation), and provide weekly	Yes	No

performance feedback (10 min or less consultation) virtually and by email		
5. Provide coaching support based on teacher participant data?	Yes	No
6. Continue virtual data collection (i.e., observing and recording data) for teachers and students?	Yes	No
7. Maintain consistent data reporting procedures (i.e., update electronic data collection form at least once a week).	Yes	No
8. Collect maintenance data for participants 1 week after conclusion of intervention?	Yes	No
9. Collect maintenance data for participants 1 month after conclusion of intervention?	Yes	No
10. Collect maintenance data for participants 2 months after conclusion of intervention?	Yes	No
% of Fidelity = _____ (#s of Yes) / _____ (#s of applicable steps) x 100 =		

APPENDIX W
Targeted Coaching Fidelity Checklist

Date: _____   Teacher: _____ Observer: _____

Did the instructional coach …	Rating	
1. Observe teacher-directed instruction three times per week and collect data on teacher's use of OTR, student engagement, and perceived frequency of student behavior using the classroom observation form?	Yes	No
2. Leave virtual annotations for the teacher during/following each observation session in GoReact that praised the teacher for correct implementation of OTR observed and provided the count and rate of OTR during each session?	Yes	No
3. Participate in a weekly virtual consultation meeting with the teacher?	Yes	No
4. Conduct a virtual consultation meeting with the teacher that lasted no more than 10 minutes?		
5. Review data on teacher performance during weekly consultation meeting?	Yes	No
6. Praise the teacher for correct implementation of OTR during weekly consultation meeting?	Yes	No
7. Provide the teacher with corrective feedback on procedures used incorrectly or infrequently during weekly consultation meeting?	Yes	No
8. Encourage the teacher to ask any questions they may have during weekly consultation meeting?	Yes	No
9. Encourage the teacher to set a daily/weekly goal for his/her use of OTR during teacher-directed instruction during weekly consultation meeting?	Yes	No
10. Send an email to the teacher following weekly consultation meeting that summarized the meeting and provided the teacher with a graph of his/her performance data?	Yes	No
The session lasted for _____ minutes.		
% of Fidelity = _____ (#s of Yes) / _____ (#s of applicable steps) x 100 =		

APPENDIX X
Targeted Coaching with Intentional Planning Fidelity Checklist

Date: _____   Teacher: _____ Observer: _____

Did the instructional coach …	Rating	
1. Observe teacher-directed instruction three times per week and collect data on teacher's use of OTR, student engagement, and perceived frequency of student behavior using the classroom observation form?	Yes	No
2. Leave virtual annotations for the teacher during/following each observation session in GoReact that praised the teacher for correct implementation of OTR observed and provided the count and rate of OTR during each session?	Yes	No
3. Participate in a weekly virtual consultation meeting with the teacher?	Yes	No
4. Conduct a virtual consultation meeting with the teacher that lasted no more than 10 minutes?	Yes	No
5. Review data on teacher performance during weekly consultation meeting?	Yes	No
6. Praise the teacher for correct implementation of OTR during weekly consultation meeting?	Yes	No
7. Provide the teacher with corrective feedback on procedures used incorrectly or infrequently during weekly consultation meeting?	Yes	No
8. Support the teacher with reviewing an upcoming lesson and intentionally planning OTRs to be included during teacher-directed instruction?	Yes	No
9. Encourage the teacher to ask any questions they may have during weekly consultation meeting?	Yes	No
10. Encourage the teacher to set a daily/weekly goal for his/her use of OTR during teacher-directed instruction during weekly consultation meeting?	Yes	No
11. Send an email to the teacher following weekly consultation meeting that summarized the meeting and provided the teacher with a graph of his/her performance data?	Yes	No
The session lasted for _____ minutes.		
% of Fidelity = _____ (#s of Yes) / _____ (#s of applicable steps) x 100 =		

APPENDIX Y
Individualized Coaching Fidelity Checklist

Date: _____   Teacher: _____ Observer: _____

Did the instructional coach …	Rating	
1. Observe teacher-directed instruction three times per week and collect data on teacher's use of OTR, student engagement, and rate perceived frequency of student behavior using the classroom observation form?	Yes	No
2. Leave virtual annotations for the teacher during/following each observation session in GoReact that praised the teacher for correct implementation of OTR observed and provided the count and rate of OTR during each session?	Yes	No
3. Engage in a brief (i.e., no more than 5 minute) virtual consultation meeting with the teacher following each observation session (i.e., either after the class period or before the end of the instructional day)?	Yes	No
4. Review data on teacher performance during consultation meeting?	Yes	No
5. Praise the teacher for correct implementation of OTR during consultation meeting?	Yes	No
6. Provide the teacher with corrective feedback on procedures used incorrectly or infrequently during consultation meeting?	Yes	No
7. Provide the teacher with an example and nonexample of OTR and/or delivery skills	Yes	No
8. Facilitates a role-play in which the teacher practiced a target behavior related to delivering OTR and/or delivery skill(s)	Yes	No
9. Encourage the teacher to ask any questions he/she may have during consultation meeting?	Yes	No
10. Provide teacher with an electronic copy of his/her graphed performance data that includes data after each consultation meeting?	Yes	No
11. Participate in a weekly consultation meeting with the teacher?	Yes	No
12. Facilitate a weekly virtual consultation meeting that lasted no more than 10 minutes?	Yes	No
13. Send an email to the teacher at the end of the week summarizing consultation meetings and providing the teacher with a graph of his/her performance data?	Yes	No
The session lasted for _____ minutes.		
% of Fidelity = _____ (#s of Yes) / _____ (#s of applicable steps) x 100 =		

APPENDIX Z
Teacher Social Validity Questionnaire

Purpose
The purpose of this brief questionnaire is to gain information on teacher perceptions about their participation in multilevel coaching sessions and their implementation of varied opportunities to respond (OTR) as an effective classroom management practice. Specifically, the research team seeks to examine whether the intervention was useful, effective, and whether implementation of the intervention with fidelity is feasible in the future.

Directions
Please circle your answers below.
1.) I have observed a decrease in student problem behaviors since implementing higher rates of opportunities to respond.

    Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

2.) I have observed an increase in active student engagement (i.e., student participation) since implementing higher rates of opportunities to respond.

    Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

3.) It was relatively easy to implement a variety of opportunities to respond at a high rate.

    Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

4.) I would recommend using high rates of opportunities to respond to any teacher who is experiencing classroom management difficulties during direct instruction.

    Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

5.) Incorporating high rates of opportunities to respond was worth the effort required.

    Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

6.) The virtual coaching model helped me implement high rates of varied opportunities to respond but did not inconvenience me or negatively impact my ability to complete other job-related responsibilities.

    Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree
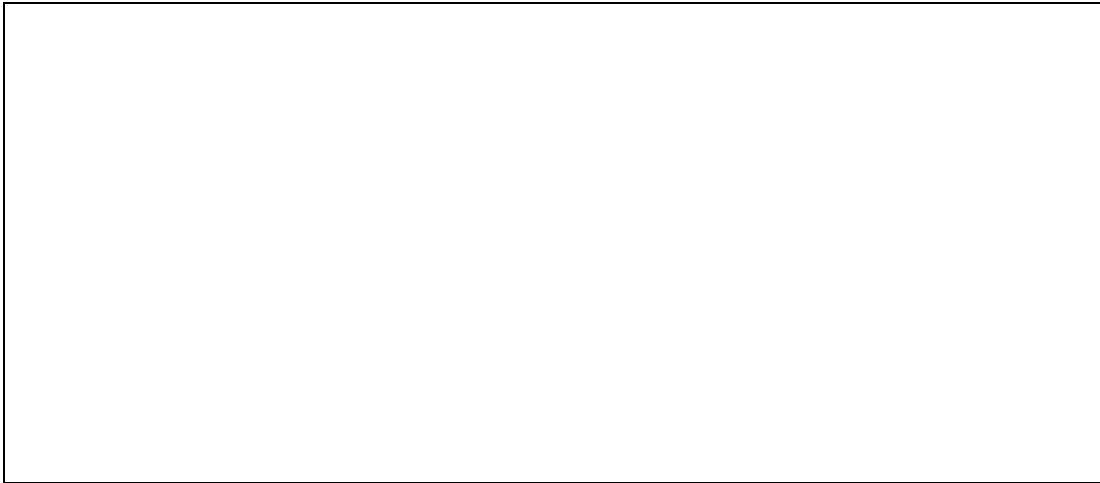
7.) The virtual coaching model helped me achieve my daily/weekly goal of implementing high rates of opportunities to respond.

    Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

8.) I would recommend this virtual coaching model to administrators to provide feedback and training on classroom management practices in the future.

Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

9.) Please write a brief comment in the box below about the usefulness of this intervention and any suggestions for future implementation.

Adapted from the RTI Approach to Increasing Desired Teacher Behavior Acceptability Questionnaire (Myers et al., 2011)

APPENDIX AA
Student Social Validity Questionnaire

<u>**Purpose**</u>
The purpose of this brief questionnaire is to gain information on student perceptions of their participation in classroom instruction that uses a variety of opportunities to respond as an effective instructional practice. Specifically, the research team seeks to examine whether the instructional practice is useful and effective in helping students remain engaged in academic instruction and if it assists with content retention.

<u>**Directions**</u>
Please circle your answers below.
1.) I have observed an increase in my teacher's use of a variety of opportunities to respond.

    Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

2.) I have observed an increase in my classroom participation since my teacher has been implementing higher rates of opportunities to respond.

    Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

3.) It is relatively easy to participate when my teacher uses a variety of opportunities to respond at a high rate.

    Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

4.) I feel safe to participate when my teacher uses a variety of opportunities to respond.

    Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

5.) I enjoy participating in class more when my teacher uses a variety of opportunities to respond.

    Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

6.) Having a variety of opportunities to respond helps me better understand or retain content information from class.

    Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

7.) When my teacher uses high rates of opportunities to respond, it helps me achieve my goal of participating more in class.

Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

8.) I would recommend that other teachers use a variety of opportunities to respond in their class.

Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

9.) Please write a brief comment in the box below about the usefulness of this intervention and any suggestions for future implementation.

APPENDIX AB
Coach Social Validity Questionnaire

Purpose

The purpose of this brief questionnaire is to gain information on coach perceptions about their participation in multilevel professional development and coaching sessions and their delivery of performance feedback at varying levels of intensity. Specifically, the research team seeks to examine whether the usefulness, effectiveness, and implementation of a multilevel professional development and coaching framework with fidelity is feasible in the future.

Directions

Please circle your answers below.

1.) I felt prepared in my role as a coach to support teachers in using high rates of opportunities to respond as an effective classroom management practice.

Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

2.) It was relatively easy to virtually collect data on teachers' use of opportunities to respond using GoReact.

Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

3.) It was relatively easy to virtually collect data on student engagement using GoReact.

Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

4.) I have observed a decrease in problem behaviors in the classrooms I support since teachers began implementing higher rates of opportunities to respond.

Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

5.) I have observed an increase in active student engagement (i.e., student participation) in the classrooms I support since teachers began implementing higher rates of opportunities to respond.

Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

6.) I would recommend the strategy of high rates of opportunities to respond to any teacher who is experiencing classroom management difficulties during direct instruction.

Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

7.) Providing tiered coaching support to teachers on high rates of opportunities to respond was worth the effort required.

Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

8.) The tiered coaching model was beneficial in achieving the goal of increasing teachers' use of opportunities to respond during teacher-directed instruction.

Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

9.) The tiered coaching model was beneficial and did not inconvenience me or negatively impact my ability to complete other job-related responsibilities.

Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

10.) I would recommend this coaching model to administrators to provide feedback and training on classroom management practices in the future.

Strongly Disagree   Disagree   Neutral   Agree   Strongly Agree

11.) Please write a brief comment in the box below about the usefulness of this intervention and any suggestions for future implementation.