EFFECTS OF CHECK-IN/CHECK-OUT ON THE BEHAVIORS OF STUDENTS WITH AUTISM SPECTRUM DISORDER WHO HAVE EXTENSIVE SUPPORT NEEDS

by

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ABSTRACT

MEGAN ELIZABETH CARPENTER. Effects of Check-In/Check-Out on the Behavior of Students with Autism Spectrum Disorder Who Have Extensive Support Needs
(Under the direction of DR. YA-YU LO)

Students with extensive support needs (ESN) are a heterogenous group of students with the most pervasive and ongoing support needs who typically receive special education services under the categories of autism spectrum disorder (ASD), intellectual disability, or multiple disabilities and often qualify to take their state's alternate assessment (Taub et al., 2017). Students with ASD who have ESN may have elevated support needs for social behavior (Jang et al., 2011; Matson et al., 2011; Shogren et al., 2017). Although there are several evidence-based practices to support the behavioral needs of students with ASD who have ESN (Steinbrenner et al., 2020), educators often have difficulty implementing these practices with fidelity (Brock et al., 2014; Morrier et al., 2011; Robertson et al., 2020). School-wide Positive Behavioral Interventions and Supports (SWPBIS) is an evidence-based framework to support the social and behavioral needs of all students with evidence-based practices, data-based decision making, and systems to support teacher implementation fidelity (Horner & Sugai, 2015; Sugai & Horner, 2006, 2009). However, students with ASD who have ESN are not consistently included in SWPBIS (Kurth & Enyart, 2016; Kurth & Zagona, 2018; Walker et al., 2018). Check-in/Check-out (CICO) is an evidence-based intervention commonly used as a Tier 2 behavioral support within a SWPBIS framework (Conley et al., 2018; Maggin et al., 2015). CICO is effective for K-12 students without disabilities and students with high incidence disabilities (Maggin et al., 2015). The purpose of this study was to examine the effects of traditional or adapted CICO on the adherence to schoolwide expectations and challenging behavior of students with ASD who have ESN. Results of this single-case, multiple baseline across participants design study

indicated there was a decrease in challenging behavior for two of the four participants when adaptations were made to the standard CICO protocol. Additionally, educators, students, and parents found CICO feasible and socially valid. Limitations, implications for practice, and suggestions for future research are discussed.

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DEDICATION

First, I would like to dedicate this dissertation to the students with disabilities and educators who work with them. I see the hard work both the students and teachers put in to improve the lives of students with disabilities. Your work matters, and I am honored to be part of it. I hope that I can continue to learn from you and share my knowledge and expertise to continue to make this world a more inclusive place.

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CHAPTER 1: INTRODUCTION

Statement of the Problem

Students with extensive support needs (ESN) include the 1-2% of students with the most intensive and pervasive support needs (Taub et al., 2017). Students with ESN typically receive special education services under an eligibility of autism spectrum disorder (ASD), intellectual disability, or multiple disabilities (Taub et al., 2017). Most students with ESN qualify to take their state's alternate assessment due to significant support needs related to cognition and additional instruction needed to generalize skills (Taub et al., 2017; Towles-Reeves et al., 2009). Students may have ESN across all domains of life, including home, community and neighborhood, school participation, school learning, health and safety, social, advocacy activities, behavior, and medical (Shogren et al., 2015, 2017). However, students' needs across domains may be uneven (e.g., a student may have significant support needs for one domain and minimal support needs in another domain) and may change over their lifetime (Shogren et al., 2015).

Students with ASD who have ESN

Students with ASD are one subgroup of students with ESN. ASD is a neurodevelopmental disorder characterized by deficits in social communication and interaction and restricted behaviors and interests (American Psychiatric Association [APA], 2013). ASD ranges in severity from Level 1, where individuals require some support, but difficulties may not be obvious, to Level 3, where individuals require substantial support and deficits are pronounced (APA, 2013). Students with ASD may experience challenges in school due to difficulties with learning through social interactions, insistence on routines, difficulties with sensory processing, and difficulties with planning and organization (APA, 2013). Additionally, many individuals

with ASD have co-occurring intellectual disability (APA, 2013; Mefford et al., 2012; Moss & Howlin, 2009; Shogren et al., 2017). Although not all students with ASD have ESN, students with co-occurring intellectual disability and/or Level 2 or Level 3 ASD may have ESN. Students with ASD who have ESN are more likely to have higher support needs for behavior and social domains compared to students with intellectual disability who have ESN (Shogren et al., 2017). Similarly, students with ASD who have ESN are more likely to exhibit challenging behavior that interferes with their own learning or the learning of others than students without disabilities and students with other disabilities (Jang et al., 2011; Matson et al., 2008).

Impact of Challenging Behavior

Researchers have suggested that teachers are underprepared to support the challenging behaviors of students with ASD who have ESN (Brock et al., 2014; Morrier et al., 2011). This could result in more intrusive and potentially harmful means of addressing challenging behavior in several ways. First, students with ASD who have ESN and who display challenging behavior may be more likely to be subject to restraint and seclusion (Westling et al., 2010). Westling et al. (2010) surveyed 1,300 parents of children with disabilities to understand their child's experiences with the use of restraint, seclusion, and aversive punishment procedures in schools. Parents completed a 23-item web-based survey and over 64% of parents reported their child had been subject to restraint, seclusion, or aversive punishment procedures. Of those parents, 78.0% reported their child had been restrained and 70.7% reported their child had been secluded. Most of the children had ASD (47.5%). Moreover, parents reported their child experienced physical injury (42.4%), physical pain (33.5%), and emotional trauma (92.2%) as a result of the restraint, seclusion, or aversive punishment procedures.

Second, challenging behavior is often a barrier to inclusion for students with ESN and can result in fewer educational opportunities with typically developing peers in general education settings (Roberts & Simpson, 2016). Roberts and Simpson (2016) reviewed the literature on perspectives of stakeholders on the inclusion of students with ASD to better understand inclusive practices and perceived facilitators of and barriers to inclusion for students with ASD. Their inclusion criteria for studies were as follows: (a) was published in a peer-reviewed journal, (b) examined the perspective of stakeholders on inclusion of students with ASD, and (c) included primary and secondary educational settings. Twenty-three studies met their inclusion criteria. Data from their analysis indicated educators were concerned about the impact of the challenging behavior students with ASD can display on the safety, academic achievement, and perceptions of other students. Furthermore, their analysis suggested that challenging behavior was a potential reason for students' exclusion from general education. This could affect post-school outcomes for students with ASD who have ESN and who exhibit challenging behaviors, because more inclusive opportunities in school are a predictor of post-school success (Mazzotti et al., 2021).

Third, students with ASD who have ESN and who display challenging behavior may have a strained relationship with teachers (Eisenhower et al., 2015). Eisenhower et al. (2015) investigated the relation between externalizing challenging behavior in school and student-teacher relationship. One hundred sixty-six 5-year-old to 7-year-old students and their teachers participated in the study. Over a 1.5-year period, teachers completed the Student-Teacher Relationship Scale (Pianta, 2001) to provide data on the student-teacher relationship and the Teacher Report Form (Achenback & Rescorla, 2001) to provide data on student challenging behavior. Data indicated students with ASD who displayed challenging behavior were more

likely to have conflict in the student-teacher relationship and did not have as close of a relationship with their teachers as students who did not display challenging behavior.

Evidence-Based Practices for Students with ASD

Because students with ASD who have ESN often engage in challenging behavior (Jang et al., 2011; Morrier et al., 2011) that can negatively affect their educational experiences (Eisenhower et al., 2015; Roberts & Simpson, 2016; Westling et al., 2010), there is a need to establish evidence-based practices that are effective to address challenging behavior for students with ASD who have ESN. Evidence-based practices are interventions and educational practices that have garnered sufficient conceptually sound empirical support to be deemed effective to address a specific need for a population of students (Horner et al., 2005).

Steinbrenner and colleagues (2020) identified 26 evidence-based practices to address the challenging behavior of students with ASD. The 26 practices include reinforcement-based procedures, antecedent-based interventions, and teaching replacement behaviors through task analysis, video modeling, and visual supports. However, Brock et al. (2014) found teachers and administrators of students with ASD were not confident in their ability to implement evidence-based practices with fidelity. This could be due to lack of teacher training. For example, in a survey of 185 teachers who supported students with ASD, only 15% of the teachers reported receiving training in strategies specific to students with ASD in their undergraduate or graduate teacher preparation programs (Morrier et al., 2011). Additionally, teachers in general report difficulty with implementing behavior intervention plans (BIPs). Robertson et al. (2020) conducted a survey of 600 teachers to investigate perceived barriers to implementing BIPs in schools. Teachers reported inconsistent implementation across staff, inadequate resources, and a lack of training as barriers to implementing BIPs with fidelity.

School-Wide Positive Behavioral Interventions and Supports

One possible way to improve training and implementation of evidence-based practices within BIPs and reduce the challenging behavior of students with ASD who have ESN may be School-wide Positive Behavioral Interventions and Supports (SWPBIS). SWPBIS is a multitiered framework that is designed to support the social and behavioral needs of all students (Horner & Sugai, 2015; Mitchell et al., 2018; Sugai & Horner, 2006). SWPBIS relies on the interconnectedness of data-based decision making, evidence-based practices at all tiers, and systems to support implementation (Horner & Sugai, 2015; Sugai & Horner, 2006). Tier 1 supports are implemented universally and proactively for all students before establishing a need for intervention (Sugai & Horner, 2009). Tier 1 supports include all staff teaching schoolwide expectations to all students (Horner & Sugai, 2015) and implementing a schoolwide recognition system for students who display appropriate behaviors associated with the schoolwide expectations (Sugai & Horner, 2002). Some students will need additional Tier 2 support. Tier 2 supports are interventions that are efficient to implement and are evidence based (Hawken et al., 2009) and include supports such as Check-In/Check-Out, Check & Connect, and social skills instruction (Hawken et al., 2009; Maggin et al., 2015; Sugai & Horner, 2002, 2009). For a few students in every school, Tier 1 and Tier 2 supports may be insufficient. These students will need more intensive, individualized, Tier 3 supports (Scott et al., 2009; Sugai & Horner, 2009). Tier 3 supports typically include individualized BIPs based on data collected from a functional behavior assessment (FBA; Scott et al., 2009). Tier 3 supports are often time and resource intensive (Crone et al., 2010; Scott et al., 2009).

SWPBIS has several documented benefits for students and staff (Noltemeyer et al., 2019) such as (a) improved school climate (Bradshaw et al., 2009; Horner et al., 2009; Simonsen et al.,

2012; Wassdrop et al., 2012), (b) lower office disciplinary referral and suspension rates (Horner et al., 2009; Kim et al., 2018; Noltemeyer et al., 2019), (c) increased academic achievement (Horner et al., 2009), and (d) increased teacher reported wellbeing (Kelm & McIntosh, 2012; Ross et al., 2012). SWPBIS is effective across grade levels (Bradshaw et al., 2009, 2010; Gage et al., 2019) and with diverse student populations (Horner et al., 2009; Simonsen et al., 2011). Furthermore, SWPBIS has been identified as an evidence-based framework (Horner et al., 2010; Mitchell et al., 2018).

Although there is a well-documented need for school-based behavioral supports for students with ESN, these students are not always included in SWPBIS implementation (Kurth & Zagona, 2018; Walker et al., 2018). Walker and colleagues (2018) surveyed 179 school-based SWPBIS leaders and found that only 61.5% of schools always include students with ESN in teaching schoolwide expectations and are less likely to do so if the students with ESN are in self-contained settings. Landers and colleagues (2012) conducted a survey of 51 PBIS state coordinators and found that only 12% of coordinators reported discussing students with ESN in planning meetings. This can lead to a lack of cognitively and physically accessible materials to implement Tier 1 and Tier 2 for students with ESN (Hawken & O'Neill, 2006). The physical and programmatic segregation some students with ESN experience by being served primarily in special education classrooms compounds this issue (Kurth & Enyart, 2016; Kurth & Zagona, 2018). However, experts in SWPBIS agree that students with ESN should be included in all tiers of SWPBIS (Zagona et al., 2021). This is especially important for students with ESN who may need Tier 3 supports, because Tier 1 and Tier 2 could serve as a foundation for Tier 3 supports (Freeman et al., 2006). Moreover, emerging data suggest students with ESN can benefit from inclusion in Tier 1 SWPBIS (Loman et al., 2018).

Check-In/Check-Out

Because students with ASD who have ESN are more likely to exhibit challenging behavior (Jang et al., 2011), they will likely need additional support beyond Tier 1. Check-In/Check-Out (CICO) is an evidence-based, commonly implemented Tier 2 intervention (Maggin et al., 2015). CICO is based on a contingency contract and involves frequent feedback throughout the day (Crone et al., 2010). There are six steps to implement CICO (Crone et al., 2010). First, the student checks in with a mentor in the morning. The mentor is a designated staff member who is not the classroom teacher. The mentor reviews expectations for the day, ensures the student has materials for class, and gives the student a daily progress report (DPR). The DPR has a list of schoolwide expectations and has space for the teacher to mark points earned for each subject area or time period in the day. Typically, the student can earn 2 points for following the expectation, 1 point for mostly following the expectation, and 0 point for not following the expectation. Second, the student gives the DPR to the teacher or teachers. Third, the teacher provides feedback and marks points at designated intervals throughout the day. Fourth, at the end of the day, the student returns to the mentor with the DPR to check out. The mentor provides constructive feedback and rewards for meeting the daily point goal. Fifth, the student brings the DPR home to a parent. The parent reviews the DPR with the student and signs the DPR. Sixth, the student returns to school with the signed DPR for the morning check-in. CICO is implemented daily.

CICO is intended to be implemented for students with frequent, nonaggressive behavior who do not respond to Tier 1 support alone (Crone et al., 2010). According to Crone et al. (2010), CICO is efficient and feasible to implement in school settings for up to 30 students simultaneously. Because of its efficiency and feasibility (Crone et al., 2010) and because

SWPBIS supports the implementation fidelity of evidence-based behavioral interventions at all tiers (McIntosh et al., 2009), teachers may experience fewer barriers to implementing CICO. Research has shown that CICO is effective in reducing challenging behavior and increasing appropriate behaviors across grade levels (Ennis et al., 2012; Hawken et al., 2007) in urban, suburban, and alternative schools (Fallon et al., 2017; McCurdy et al., 2007; Simonsen et al., 2011) for students without disabilities and for students with high-incidence disabilities (e.g., learning disabilities, behavior disorders; Hawken et al., 2007; Simonsen et al., 2011).

To increase its effectiveness, CICO is often adapted to meet the needs of students (Majeika et al., 2020). Adaptations are made to the (a) process, (b) DPR, (c) teacher feedback, (d) expectations, (e) parent communication, (f) check-in procedure, (g) check-out procedure, and/or (h) reinforcers (Majeika et al., 2020). According to Majeika et al. (2020), adaptations to CICO are more resource and time efficient than Tier 3 interventions. Recently, in response to the abrupt shift from in-person instruction to distance learning due to COVID-19, the Center on Positive Behavioral Interventions and Supports (PBIS; 2020) released guidance on adapting CICO for distance learning. The Center on PBIS recommended schools continue to provide CICO as a Tier 2 support for students. The school-based team will need to convert the DPR to a virtual format and ensure the schedule matches the student's distance learning schedule. Additionally, the team will conduct the check-in and check-out virtually. However, to date, there is little evidence of the effectiveness of CICO, during in person or virtual instruction, for students with ESN within a SWPBIS framework (Maggin et al., 2015; Majeika et al., 2020). None of the studies used to classify CICO as an evidence-based practice included students with ESN (Maggin et al., 2015). Furthermore, none of the studies in Majeika et al.'s (2020) literature review of adaptations to CICO included students with ESN. The suggestions outlined by the

Center on PBIS to adapt CICO for virtual instruction also does not specifically address the needs of students with ASD who have ESN. Considering the evidence support of CICO for students without disabilities and those with high-incidence disabilities, it may be an effective intervention for students with ESN because students with ESN can benefit from reinforcement-based interventions (Steinbrenner et al., 2020). Additionally, CICO is less time and resource intensive than current evidence-based behavior practices for students with ESN (e.g., function-based individualized supports; Scott et al., 2009; Steinbrenner et al., 2020), which may increase the feasibility of implementation by school-based personnel. Finally, within a SWPBIS framework, Tier 1 and Tier 2 supports provide the necessary foundation for Tier 3 supports.

Statement of Purpose and Research Questions

The purpose of this study was to extend current knowledge on the effectiveness of CICO as a Tier 2 intervention and to promote the inclusion of students with ASD who have ESN in SWPBIS by investigating the effects of traditional six-step and adapted CICO within the context of a mixture of remote and in-person instruction on the challenging and appropriate behaviors of students with ASD who have ESN. Due to the school's blended learning format (e.g., in person and virtual instruction), traditional six-step CICO was implemented with adaptations for virtual instruction, such as a modified schedule for obtaining points and a digital DPR. Adapted CICO included embedded evidence-based practices for students with ASD, as well as adaptations for virtual instruction during remote learning periods. Specifically, this study aimed to answer the following research questions.

1. What are the effects of traditional six-step CICO on the adherence to schoolwide expectations (measured as percentages of points on DPR) of students with ASD who have ESN?

2. What are the effects of traditional six-step CICO on the challenging behaviors of students with ASD who have ESN?
3. What are the effects of adapted CICO that included evidence-based practices for students with ASD on the adherence to schoolwide expectations (measured as percentages of points on DPR) of students with ASD who have ESN?
4. What are the effects of adapted CICO that included evidence-based practices for students with ASD on the challenging behaviors of students with ASD who have ESN?
5. What are the perceptions of teachers, mentors, students, and parents on the effectiveness and feasibility of traditional six-step CICO and adapted CICO for students with ASD who have ESN?

Significance of Study

This study contributes to the literature in several ways. First, there is limited literature on the inclusion of students with ESN in SWPBIS implementation (Boden et al., 2018; Kurth & Zagona et al., 2018; Maggin et al., 2015; Majeika et al., 2020). Specifically, none of the studies reviewed to qualify CICO as an evidence-based practice included students with ESN (Maggin et al., 2015), and none of the studies included in a literature review to analyze adaptations to CICO included students with ESN (Majeika et al., 2020). This study will provide empirical evidence of the effectiveness of including students with ASD who have ESN in CICO and SWPBIS. Second, this study builds on the literature base of adapted CICO (Majeika et al., 2020). According to Majeika et al. (2020), although adaptations to CICO are common, many researchers do not make adaptations systematically or based on data. Further, many researchers do not describe the process for making adaptations. Throughout the study, I, the researcher, used a systematic process to make adaptations in collaboration with the teachers based on (a) data collected from

an FBA, (b) data collected during baseline and traditional six-step CICO implementation, (c) documented IEP accommodations, and (d) teacher input. Third, this study adds to the literature based on function-based adaptations to CICO, building on the work of Campbell and Anderson (2008). For example, when students needed adaptations to the traditional six-step CICO, I used data from the FBA to include function-based reinforcers. Fourth, this study extends the work of Bunch-Crump and Lo (2017) and Sobalvaro et al. (2015) on parent training related to CICO. Sobalvaro et al. (2015) found information packets for parents were insufficient to increase parent participation. Bunch-Crump and Lo (2017) found direct instruction in CICO can increase parent participation. In this study, I used behavioral skills training (BST), an empirically-based strategy that includes instruction, modeling, role play, and feedback, to increase implementation fidelity of evidence-based practices (Hassan et al., 2018; Kirkpatrick et al., 2019; LaBort et al., 2019). Fifth, this study extends the data on social validity of CICO. Social validity measures often are not included in single-case research (Carter & Wheeler, 2019; Snodgrass et al., 2018) and are rarely included in the CICO literature. In this study, I collected social validity data from parent, school staff (i.e., teachers and mentors), and student participants using questionnaires to explore participants' perceptions about traditional and adapted CICO for students with ASD who have ESN. Finally, this study extends the literature around the effectiveness of CICO in alternative environments. To date, CICO has not been conducted in virtual learning environments. Because some of the instruction occurred virtually due to COVID-19, the study included CICO implementation in a mixture of virtual and in-person learning environments.

Delimitations

The purpose of this study was to extend current knowledge on the effectiveness of CICO as a Tier 2 intervention and to promote the inclusion of students with ASD who have ESN in

SWPBIS by investigating the effects of traditional and adapted CICO on the appropriate and challenging behaviors of students with ASD who have ESN. It is important to identify delimitations that could affect the analysis of results. First, the use of a single-case research design limits the external validity of the findings. Second, because it was not possible to directly observe all aspects of Tier 1 implementation, I depended on teachers' and paraprofessionals' responses to a weekly survey with questions about their Tier 1 implementation. As a result, a more objective data collection method to measure the level of Tier 1 implementation fidelity was not available. Third, I did not measure maintenance in this study. If students responded to CICO (i.e., traditional six-step or adapted), the teacher and school-based team were responsible for fading the intervention based on school-based data decision rules. The school-based team may have decided to continue the intervention or fade it after the study ended. This was consistent with the Tier 2 implementation procedures within the school. Finally, I conducted all training sessions and observations virtually due to the school district's reopening plan to reduce the COVID-19 outbreak. This required all school staff and parents to have access to a Wi-Fi enabled device. This could have potentially limited parent participation. Furthermore, this could have resulted in errors in data collection when the student left the view of the camera or when audio was unclear.

Definition of Terms

This section includes key terms used throughout the study and their definitions. Knowledge of these terms is critical to understand the conceptual framework and methodology of the study and to interpret the results.

Adaptations to Check-In/Check-Out - Changes to the standard elements of traditional six-step CICO to individualize the intervention in an effort to increase effectiveness (Majeika et

al., 2020). Adaptations may include function-based reinforcers, visual supports, and increased frequency of reinforcement (Majeika et al., 2020).

Applied Behavior Analysis (***ABA***) - "A science devoted to understanding and improving human behavior" (Cooper et al., 2020, p. 2) by rearranging the environmental stimuli.

Autism Spectrum Disorder (***ASD***) - A neurodevelopmental disorder classified by difficulties with social communication and social interaction, which often manifest as deficits in social-emotional reciprocity, difficulties with nonverbal communication, difficulties developing, understanding, and maintaining relationships, and restrictive, repetitive behaviors and interests (APA, 2013).

Behavioral Skills Training (***BST***) - A training protocol that includes instruction, modeling, role play, and feedback (Kirkpatrick et al., 2019). BST has been shown to improve teachers' and parents' implementation fidelity of a variety of evidence-based practices (Kirkpatrick et al., 2019).

Challenging Behavior - Destructive behavior that causes harm to self or others, disruptive behavior that interferes with the learning of self or others, or distracting behavior that differs from the typical behavior of same-age peers (Walker et al., 2020).

Check-In/Check-Out (***CICO***) - A commonly used, evidence-based, Tier 2 intervention based on contingency contracts and reinforcement that is used to address challenging behavior of students within a SWPBIS framework (Crone et al., 2010; Maggin et al., 2015; Majeika et al., 2020). CICO includes six steps: (a) student checks-in with a mentor, (b) student gives DPR to teacher(s), (c) teachers provide feedback to student using DPR throughout the day, (d) student checks-out with the mentor, (e) student brings DPR home for parents to review and provide feedback, and (f) student returns the signed DPR to school the next day (Crone et al., 2010).

CICO originated as the Behavior Education Program (BEP) and is often referred to as such in the literature (Crone et al., 2010).

Check-In/Check-Out (***CICO***) ***Mentor*** - A staff member who checks in before school with the student receiving CICO, reviews expectations, and reviews the DPR (Crone et al., 2010). This staff member also checks out in the afternoon with the student receiving CICO, reviews the DPR, provides feedback, and reinforcement (Crone et al., 2010).

Contingency Contracts - An agreement between at least two people that specifies the exact actions each person will take and the reward the student will get if the actions are completed (Cooper et al., 2020).

Daily Progress Report (DPR) - A daily chart students who receive CICO carry (Crone et al., 2010). On the chart, there is a list of schoolwide expectations and a space for teachers to mark points for each interval or subject area to reflect the student's adherence to each expectation for the designated interval or subject area (Crone et al., 2010).

Evidence-Based Practice - Practices and interventions that have enough rigorous empirical support to show they are effective for a certain population in a specific context (Horner et al., 2015).

Functional Behavior Assessment (***FBA***) - A systematic procedure that includes indirect measures (e.g., interviews, rating scales), direct measures (i.e., direct observations), and systematic manipulation of variables related to the targeted challenging behavior to determine the function of the behavior (Cooper et al., 2020; O'Neill, 2014).

Function-Based Intervention (***FBI***) - An intervention to support behavior change that is based on manipulating antecedents and consequences based on the maintaining consequence of the challenging behavior (Cooper et al., 2020; Sugai et al., 2000).

Intellectual Disability - A neurodevelopmental disorder classified by deficits in intellectual functional and adaptative functioning that manifest in early development and is commonly co-occurring with ASD (APA, 2013).

Implementation Fidelity - The extent to which all components of an intervention are implemented with adequate intensity, frequency, and duration (Keller-Margulis, 2012). It is essential to determining the effectiveness of an intervention (Keller-Margulis, 2012).

Schoolwide Expectations - A set of three to five positively stated, contextually appropriate expectations that are appropriate for all staff and students in all settings (Sugai & Horner, 2009). Within a SWPBIS framework, schoolwide expectations are operationally defined and explicitly taught (Sugai & Horner, 2009). Students are rewarded for demonstrating behaviors associated with the expectations (Sugai & Horner, 2009).

School-Wide Positive Behavioral Interventions and Supports (***SWPBIS***) - A multitiered framework to support the behavior and social needs of all students to promote positive academic and social outcomes in school (Horner et al., 2010).

Students with Extensive Support Needs (ESN) - The 1-2% of students with the most intensive and pervasive support needs who typically receive special education services under the categories of ASD, intellectual disability, or multiple disabilities and often qualify to take their state's alternate assessment (Taub et al., 2017).

Tier 1 - The first tier of SWPBIS provided to all students to prevent challenging behavior (Horner et al., 2010; Sugai & Horner, 2009). Tier 1 supports include establishing and teaching schoolwide expectations and implementing a schoolwide recognition system for students who display behaviors related to the expectations (Horner et al., 2010; Sugai & Horner, 2009).

Tier 2 - The second tier of SWPBIS to provide supplemental support to Tier 1 to students who do not respond to Tier 1 supports alone (Horner et al., 2010; Sugai & Horner, 2009). Commonly utilized Tier 2 interventions include Check & Connect, First Steps to Success, Social Skills Training, and Check-In/Check-Out (Hawken et al., 2009).

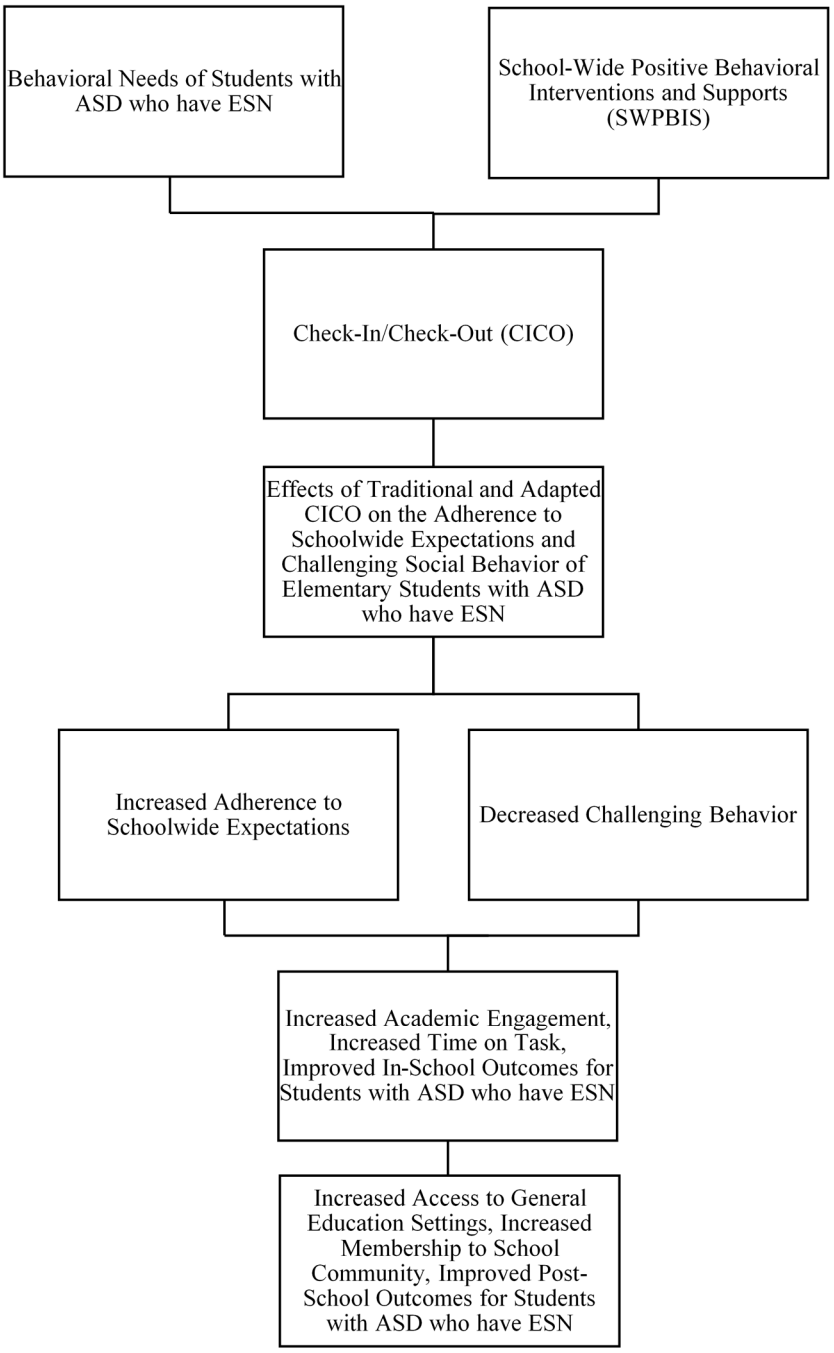
Tier 3 - The third tier of SWPBIS to provide intensive, individualized, function-based supports for students with the most intensive behavioral needs who do not respond to Tier 1 and Tier 2 (Horner et al., 2010; Sugai & Horner, 2009). Tier 3 supports are supplemental to Tier 1 and Tier 2 (Horner et al., 2010; Sugai & Horner, 2009).

CHAPTER 2: REVIEW OF LITERATURE

This chapter includes a review of literature relevant to the inclusion of students with ASD who have ESN in CICO, a SWPBIS Tier 2 intervention. Figure 1 depicts the logic model, which serves as a foundation for this literature review. This literature review comprises three sections. The first section includes an explanation of students with ESN, the social and behavioral needs of students with ASD who have ESN, current evidence-based practices to address challenging behavior, and difficulties with implementation fidelity. The second section consists of an overview of SWPBIS, description of the benefits of SWPBIS, and an exploration of the state of inclusion of students with ESN in SWPBIS. The third section presents a review of relevant CICO literature, including technical components of CICO, effectiveness of CICO, and adaptations to CICO.

Figure 1

Logic Model



Students with Extensive Support Needs

Students with ESN comprise a heterogeneous group of students with the most pervasive and ongoing support needs (Taub et al., 2017). Students with ESN typically receive special education services under the categories of ASD, intellectual disability, or multiple disabilities (Taub et al., 2017). Students with ESN often qualify to take their state's alternate assessment, because they have additional support needs related to cognition, require additional instruction to generalize learning, and the standard assessment could not accurately measure their achievement on the general education curriculum (Towles-Reeves et al., 2009).

Towles-Reeves and colleagues (2009) conducted a survey of teachers of students who take the alternate assessment to describe this specific student population. Because students who take the alternate assessment typically have ESN, the results of their survey help describe the heterogeneous population of students with ESN. Teachers across three states completed one survey for each student they supported who took the alternate assessment. Their students were in 3rd through 11th grades. Teachers completed a total of 1,440 surveys. Towles-Reeves and colleagues reported data separately for each state, with commonalities in the results across the three states. Data from the survey indicated a majority of students had functional math and reading skills, but only 2-4% of students who took the alternate assessment read fluently with understanding. Furthermore, students had a large range of communication skills. Although most students used some form of symbolic communication, 25-37% of students across the states used nonsymbolic communication (e.g., gestures, facial expressions). Additionally, data indicated 42-59% of students could initiate and sustain social interactions. Overall, the data from this study showed students with ESN are a heterogeneous group with varying support needs across domains.

Students with ASD Who Have ESN

Students with ASD are one subgroup of students with ESN; however, not all students with ASD will have ESN. ASD is a neurodevelopmental disorder with symptoms that appear during childhood development (APA, 2013). In order to receive an ASD diagnosis, the individual must display "persistent deficits in social communication and social interaction across multiple contexts" and "restricted, repetitive patterns of behavior, interests, or activities" (APA, 2013). Deficits in social communication and social interaction may manifest as (a) difficulties with nonverbal communication (e.g., facial expressions, eye contact, body language); (b) difficulties with gaining, maintaining, and understanding relationships; and/or (c) difficulty responding to or initiating social interaction (APA, 2013). Restricted, repetitive patterns of behavior, interests, or activities could manifest as (a) stereotypic movements (e.g., repetitive hand movements, repetitive toy play); (b) resistance to changes in schedule; (c) restricted interests; and/or (d) underreaction or overreaction to sensory input (APA, 2013). Individuals with ASD are likely to experience challenges in school due to (a) difficulties learning through social interactions, (b) insistence on routines, (c) difficulties with sensory processing, and (d) difficulties with planning and organization (APA, 2013).

ASD comprises a range of symptoms ranging in support needs. APA (2013) describes three levels of ASD based on level of support needed. Individuals with Level 1 ASD require the least amount of support. With supports in place, individuals with Level 1 ASD may simply appear atypical or awkward in social interactions. With supports, the vocabulary and syntax for individuals with Level 1 ASD may be age appropriate, but they still may have difficulties maintaining relationships. Additionally, organization and planning skills may be difficult for those with Level 1 ASD. People with Level 2 ASD require more substantial support. Even with

supports in place, individuals with Level 2 ASD may have atypical responses to social initiations or atypical attempts at social interactions, may have difficulties with changes in routine or activity, and often display repetitive behaviors. Individuals with Level 3 ASD require the most substantial support, as they may have limited or no vocal communication and limited social interactions. Moreover, individuals with Level 3 ASD may have significant difficulties with changes in routine and activity.

In addition to the different levels of support needs, many individuals with ASD often have co-occurring disabilities such as intellectual disability (Mefford et al., 2012; Moss & Howlin, 2009; Shogren et al., 2017) and a mental health disorder (Simonoff et al., 2008). Students with Level 2 or Level 3 ASD and/or co-occurring disabilities often have ESN. According to Shogren et al. (2017), when compared to students with intellectual disability only, students with ASD and intellectual disability have statistically significant higher behavioral support needs and social activity support needs. Further, students with ASD who have ESN are more likely to need significant behavioral and social supports for success across life. Matson et al. (2008) investigated the correlation between (a) the amount and severity of challenging behavior of children with ASD, children with typical development, and children with psychopathology or atypical development not related to ASD, and (b) the severity of ASD and type of problem behavior exhibited. Of the 313 children included in the study, 182 had ASD, 100 did not have a documented disability, and 31 had psychopathology or atypical development not related to ASD. Children's ages ranged from 2 to 7 years old. Parents of all student participants completed the *Autism Spectrum Disorders – Diagnostic for Children* (Matson, Gonzales, Wilkins et al., 2008) to measure severity of ASD and the *Autism Spectrum Disorder – Behavior Problems for Children* (Matson, Gonzales, & Rivert, 2008) to measure severity of challenging

behavior. Data indicated 94.3% of children with ASD displayed challenging behavior, which was significantly greater than peers without a documented disability and peers with psychopathology or atypical development not related to ASD. Data also indicated that severity of ASD was positively correlated with challenging behavior. Extending on the work of Matson et al., Jang and colleagues (2011) investigated the correlation between autism severity and prevalence of challenging behavior of 84 children with ASD. The children ranged in age from 2 to 18 years old. Parents of the children with ASD completed the same measures as in Matson et al. Of the 84 parents who participated, 94% reported their child with ASD displayed some form of challenging behavior. Similar to the findings from Matson et al., data indicated the severity of ASD was significantly correlated to the severity of challenging behavior.

Additional research also shows that children with ASD will continue to need supports in school through adolescence (Matson et al., 2010). Matson and colleagues (2010) conducted a correlational study to determine the relation between age and prevalence of challenging behavior in 167 children with ASD. The children were between 3 and 14 years of age. Parents of the children with ASD completed the *Autism Spectrum Disorders – Problem Behaviors Child* (Matson, Gonzales, & Rivert, 2008) measure to assess problem behavior, co-morbid psychopathy, and ASD symptoms of their child. Data indicated there was no statistically significant difference in the prevalence of challenging behavior between young children (i.e., ages 3-6), children (i.e., ages 7-10), and young adolescents (i.e., ages 11-14). These data indicate the need for supports to address the chronic and ongoing behavioral needs of students with ASD.

In conclusion, students with ASD who have ESN have high support needs for behavior and social activities (Shogren et al., 2017). Moreover, data from Matson et al. (2008) and Jang et al. (2011) indicated students with ASD who have ESN are more likely to engage in challenging

behavior compared to students with ASD who do not have ESN. School personnel must be prepared to provide interventions and supports across all ages for students with ASD who have ESN (Matson et al., 2010).

Behavioral Interventions for Students with ASD in Schools

Current research supports the positive effects of behavioral interventions implemented in school settings for students with ASD across grade levels and in special education and general education settings (de Bruin et al., 2013; Lory et al., 2020; Martinez et al., 2016; Steinbrenner et al., 2020). For example, Martinez and colleagues (2016) conducted a review of intervention studies to examine the effects of school-based interventions on challenging behavior in 3-year-old to 8-year-old children with ASD. Their search included single-case design studies published between 2000 and 2015 with participants with ASD ages 3-8 years old who received an intervention in a preschool or elementary school to address challenging behavior. Twenty-six studies met their inclusion criteria. Of the participants in the studies, most were school-aged (i.e., 5 years old or older; 80%), had complex communication needs (77%), and performed below grade level (76%). Data suggested young children with ASD can benefit from effective behavioral interventions (i.e., antecedent-based interventions, function-based interventions, reinforcement, instructional interventions, and multicomponent interventions) implemented in school settings.

In addition, de Bruin and colleagues (2013) conducted a review of intervention studies to examine the effects of public school-based interventions, specifically antecedent-based strategies, consequence-based strategies, self-management, and video-based strategies, on the behavior of adolescent and young adult students with ASD. Their search included single-case design studies with participants 12-22 years of age with a confirmed diagnosis of ASD who

attended public schools where researchers implemented at least one behavior strategy (i.e., antecedent-based strategies, consequence-based strategies, self-management, and video-based strategies). To be included, studies had to meet the What Works Clearinghouse single-case design standards. Thirty-four studies met their inclusion criteria. Most studies took place in special education settings. Overall, interventions had a positive effect on challenging behavior of adolescents and young adults with ASD. Additionally, antecedent-based strategies, consequence-based strategies, and video-based strategies met the criteria for evidence-based practices.

Most recently, Lory and colleagues (2020) conducted a review of literature to examine the effects of interventions to support the behavior of students with developmental disabilities (i.e., ASD, intellectual disability, other developmental delays) in inclusive settings. Their search included single-case design studies with school-aged participants (i.e., 3-22 years old) with one or more developmental disabilities who received an intervention to address challenging behavior in a school-based setting in the presence of peers who were typically developing. Twenty-six studies met their inclusion criteria, and 16 studies met the What Works Clearinghouse research design standards. Results of Tau-U analyses indicated an overall strong intervention effect (.94) on the behavior of students with developmental disabilities in inclusive settings.

Steinbrenner and colleagues (2020) conducted an extensive review of literature to define and describe practices that have sufficient literature base to be classified as evidence-based practices for students with ASD. This was an update to the original evidence-based practice reviews from the same group of researchers (i.e., Odom et al., 2010; Wong et al., 2014). Researchers included all single-case and group design studies between 1990 and 2017 with participants with ASD ages 3-22 years old and who received an intervention to address behavior, development, academic, or vocational skills. Studies must have shown positive intervention

effects to be included in the review. Six hundred twenty-nine studies met their inclusion criteria. Of these studies, 48.1% were conducted in schools. Researchers then reviewed the studies based on quality indicators. To qualify as an evidence-based practice, there had to be (a) two or more high quality group design studies from at least two different research groups, (b) five high-quality single-case design studies from at least three different research groups with a total of at least 20 participants across studies, or (c) a combination of one group design study and three high-quality single-case studies. Steinbrenner et al. identified 28 evidence-based practices. Twenty-six of the 28 practices can be implemented to effectively address challenging behavior of students with ASD who are in elementary and middle schools (i.e., 6-14 years old); these practices are (a) antecedent-based interventions; (b) augmentative and alternative communication; (c) behavior momentum intervention; (d) cognitive behavioral/instructional strategies; (e) differential reinforcement of alternative, incompatible, or other behavior; (f) discrete trial training; (g) exercise and movement; (h) extinction; (i) functional behavioral assessment; (j) functional communication training; (k) modeling; (l) music-mediated intervention; (m) naturalistic intervention; (n) parent-implement intervention; (o) peer-based instruction and intervention; (p) prompting; (q) reinforcement; (r) response interruption and redirection; (s) self-management; (t) sensory integration; (u) social narratives; (v) social skills training; (w) technology-aided instruction and intervention; (x) time delay; (y) video modeling; and (z) visual supports.

The above reviews of literature support 26 evidence-based practices for addressing the challenging behavior of students with ASD (Steinbrenner et al., 2020). Furthermore, researchers have found that when applied in school settings, behavior interventions can decrease challenging behavior in students with ASD (de Bruin et al., 2013; Lory et al., 2020; Martinez et al., 2016).

Technology-Aided Instruction and Intervention

Due to an increase in virtual learning environments because of COVID-19, there is a need for adopting evidence-based practices for students in virtual learning environments. Technology-aided instruction and intervention is an evidence-based practice for students with ASD (Steinbrenner et al., 2020). With technology-aided instruction and interventions, "technology is the central feature and the technology is specifically designed or employed to support the learning or performance of a behavior or skill for the learner" (Steinbrenner et al., 2020, p. 29). Technology-aided instruction and interventions includes specific computer programs, self-monitoring applications, robots, and virtual reality (Steinbrenner et al., 2020). Some technology-aided instruction and interventions can incorporate other evidence-based practices, such as prompting (e.g., Pennington et al., 2014). Researchers have demonstrated that technology-aided instruction and interventions can address challenging behavior for students with ASD (Steinbrenner et al., 2020).

Lack of Adopting Evidence-based Practices

Although researchers have identified evidence-based practices to support students with ASD who exhibit challenging behavior (de Bruin et al., 2013; Steinbrenner et al., 2020), teachers do not always implement evidence-based practices in school. For example, Knight et al. (2019) conducted a survey of 535 special education teachers who supported students with intellectual disability and/or ASD to examine their use of evidence-based practices and training received related to evidence-based practices. Eighty-six percent of teachers indicated that they were unsure if they were implementing evidence-based practices. Additionally, teachers reported using ineffective or harmful practices more frequently than evidence-based practices. Brock and colleagues (2020) supported these findings with data from a survey of 70 special education

teachers and 29 general education teachers who supported students with ASD to identify the teachers' top priorities for students with ASD and strategies teachers implemented to help address the priorities. Teachers in the study identified academic/pre-academic, social, communication, challenging behavior, and cognitive needs as their top five priority areas for students with ASD. Additionally, the teachers were more likely to prioritize challenging behavior for students with the most intensive support needs. To address students' goals in these priority areas, teachers reported using evidence-based practices for only half of the goals, and students with ASD and ESN were most likely to struggle to make progress towards their goals.

The limited use of evidence-based practices for students with ASD in schools could be because teachers are ill prepared to implement evidence-based practices for students with ASD (Brock et al., 2014; Morrier et al., 2011). Morrier and colleagues (2011) conducted a survey of teachers of students with ASD to compare characteristics of teachers using evidence-based practices and teachers who were not using evidence-based practices. The survey included a list of commonly used strategies (some were evidence-based practices and others were not) to teach students with ASD and questions that asked teachers which strategies they used to support students with ASD. For each practice selected, teachers were to identify the type of training received on the strategy. One hundred eighty-five teachers completed the survey. Less than 5% of respondents reported using evidence-based practices for students with ASD. There was no significant difference among teachers who reported using evidence-based practices and teachers who did not report using evidence-based practices in terms of teaching experience, level of education, or caseload. In terms of training, only 15% of teachers reported receiving training in their undergraduate or graduate programs related to implementing teaching strategies specifically for students with ASD. Additionally, most teachers reported being self-taught in the strategies.

In a related study, Brock and colleagues (2014) conducted a survey to explore the perceived professional development needs of school staff working with students with ASD. Four hundred fifty-six teachers, special education supervisors, and administrators in Tennessee who worked with students with ASD completed the survey. Overall, practitioners and administrators were not highly confident in their ability to implement evidence-based practices with fidelity. Notably, only 55.0% were quite or very confident in their ability to implement reinforcement procedures, and 37.6% were quite or very confident in their ability to implement antecedent-based interventions. However, teachers reported they were only somewhat likely to access professional development in the next year, and it would most likely be in the form of workshops, printed materials, and websites. Teachers in the study also reported that they were unlikely to have access to conferences and coaching.

The issue of effectively addressing challenging behaviors of students with ASD who have ESN is further compounded by reported challenges with implementing evidence-based practices as part of a behavior intervention plan (BIP) with fidelity. Robertson and colleagues (2020) conducted a survey to identify barriers to implementing BIPs with fidelity. Six hundred and two educators (e.g., teachers, administrators, paraprofessionals) responded to the survey. Most participants (94%) were special education teachers. The most commonly identified barriers were outside factors (e.g., home life, student characteristics, medical needs), inconsistent implementation across staff, inadequate resources, ineffective BIP, and a lack of training.

In sum, teachers do not consistently implement evidence-based practices for students with ASD to address behavioral needs (Brock et al., 2014, 2020; Morrier et al., 2011; Robertson et al., 2020). This is often due to a lack of training and resources (Brock et al., 2014; Morrier et al., 2011; Robertson et al., 2020).

Summary

Students with ESN represent a heterogeneous group of students who have the most intensive and ongoing support needs (Taub et al., 2017). Individuals with ASD is one subgroup of students with ESN, with many students with ASD also having co-occurring disabilities. Research has shown that students with ASD who have ESN exhibit challenging behavior at higher rates than (a) peers without a disability, (b) peers with psychopathology or atypical development not related to ASD, and (c) peers with ASD without ESN (Jang et al., 2011; Matson et al., 2008) and have increased support needs for social activities and behavior (Shogren et al., 2017). Although researchers have identified evidence-based practices to effectively address challenging behavior of students with ASD who have ESN (Steinbrenner et al., 2020; Lory et al., 2020), and these evidence-based practices can be implemented in school settings to address challenging behavior (de Bruin et al., 2013; Lory et al., 2020; Martinez et al., 2016), most teachers are not implementing evidence-based practices for students with ASD who have ESN with fidelity to address student challenging behavior (Brock et al., 2020; Hess et al., 2008). This could be due to lack of training (Morrier et al., 2011; Robertson et al., 2020) and professional development (Brock et al., 2014; Robertson et al., 2020). This issue is further compounded by several barriers teachers reported experiencing when implementing BIPs, such as a lack of training, inadequate resources, and inconsistent implementation across staff (Robertson et al., 2020). School-Wide Positive Behavioral Interventions and Supports offers a potentially effective systems approach to supporting students with ASD who have ESN and their teachers.

School-Wide Positive Behavioral Interventions and Supports

School-Wide Positive Behavioral Interventions and Supports (SWPBIS) is a multitiered framework that supports the social and behavioral needs of all students, especially those with

disabilities, in a school setting (George et al., 2009; Horner & Sugai, 2015; Mitchell et al., 2018; Center on Positive Behavioral Interventions and Supports [PBIS], 2019; Sugai & Horner, 2006, 2009). Currently, over 27,000 schools in the United States of America implement SWPBIS (PBIS, 2018). The goal of SWPBIS is to promote a standardized positive culture throughout the school to support teaching and learning, thus promoting maximum academic outcomes (Sugai & Horner, 2009). SWPBIS focuses on prevention by considering the context in which behavior occurs (Sailor et al., 2009). According to Sugai and Horner (2009), SWPBIS is not an intervention; it is a framework focused on implementation fidelity of evidence-based practices and sustainability of those practices. Central to the framework is the interconnectedness of data-based decision making, evidence-based practices across tiers, and systems to support implementation across three continuous tiers of support (Horner & Sugai, 2015; Sugai & Horner, 2006, 2009). SWPBIS is a sustainable framework with a strong, coordinated leadership team in the school that prioritizes supporting the behavioral needs of all students, research-based practices across the tiers that are efficient and effective, and ongoing data collection at all tiers (McIntosh et al., 2009).

Three Tiers of Support

Tier 1

Tier 1 is the primary, preventative tier aiming to support all students in a school implementing a SWPBIS framework (George et al., 2009). It consists of the core curriculum for teaching behavior to all students (George et al., 2009) and offers a base on which all other supports are built (Anderson & Kincaid, 2005). According to Sugai and Horner (2009), there are six defining features of Tier 1 supports.

First, staff must be on board to implement SWPBIS (Sugai & Horner, 2009). For a school to implement SWPBIS effectively, all staff (e.g., teachers, administrators, bus drivers, paraprofessionals, cafeteria workers) must be committed to a common approach in supporting behavior and implementing discipline practices. Without a coordinated effort by all staff, SWPBIS is not sustainable (McIntosh et al., 2009).

Second, school-based teams must identify three to five positively stated schoolwide expectations (e.g., be safe, be responsible, be respectful; Gage et al., 2019; Sugai & Horner, 2009). These expectations should be operationally defined across all school settings (e.g., cafeteria, classroom, playground, hallway; Gage et al., 2019; Horner et al., 2010). For example, if a school had an expectation of being safe, the SWPBIS team would define safety for the playground (e.g., sit on swings), classroom (e.g., keep hands to yourself, keep all legs of the chair on the ground), and hallway (e.g., walk on the righthand side of the hallway). The expectations and operationally defined behaviors related to each expectation should be posted in all locations throughout the school (George et al., 2009).

Third, staff should explicitly teach the schoolwide expectations through direct modeling, practice, and feedback (Gage et al., 2019; George et al., 2009; Sugai & Horner, 2009). Staff should model the specific behaviors related to each expectation, provide opportunities for all students to practice demonstrating the behaviors, and provide feedback for students (George et al., 2009). The posted expectations are used to reinforce the lessons. In response to COVID-19, the Center on Positive Behavioral Interventions and Supports (Center on PBIS, 2020) released guidance on teaching the expectations during remote instruction. The Center on PBIS recommends keeping the schoolwide behavior expectations consistent for the remote instruction but specifically define behaviors related to each expectation in the remote setting, such as the use

of video, audio, and chat. Furthermore, educators should still explicitly teach expectations directly in a manner that is as interactive as possible.

Fourth, Tier 1 includes a system to acknowledge and reward students' appropriate behaviors (Horner et al., 2010; Sugai & Horner, 2009). The acknowledgement system should be simple and include all students (Horner et al., 2010). For example, staff could give students tickets for a raffle or sign individual signature cards when students demonstrate the appropriate behaviors associated with schoolwide expectations, and students can go to the school store to receive a prize when their ticket is drawn or when their card is filled with signatures. The acknowledgement system should allow students to earn rewards without taking away earned rewards (George et al., 2009). Additionally, schools should have an acknowledgement system in place for staff (George et al., 2009). For example, staff may earn tickets from colleagues for effectively supporting student behavior for a raffle that may include an administrator covering morning bus supervision or being given a closer parking spot for the month.

Fifth, Tier 1 includes a continuum of consequences for rule violations (Horner et al., 2010; Sugai & Horner, 2009). The consequences should be applied consistently by all staff in all settings (George et al., 2009). Additionally, consequences should match the intensity and range of challenging behavior (George et al., 2009). When developing consequences, the SWPBIS team should be mindful of the potentially reinforcing effects of removing a student from class (George et al., 2009).

Sixth, Tier 1 should include a system for making data-based decisions (George et al., 2009; Sugai & Horner, 2009). Schools should identify the data they need and systems already in place. Tier 1 must include systems to track behavior, define problem behavior, and systematically report and analyze data related to office disciplinary referrals (ODRs; George et

al., 2009). Schools often have systems in place that can be enhanced to provide the data needed to monitor the effectiveness of Tier 1. Sources of data may include ODRs, referrals to special education, school climate survey, and attendance data. The SWPBIS team should develop a data collection form for teachers to track minor behavior infractions to further inform the effectiveness of Tier 1 and needs of the student population (George et al., 2009). These sources of data will be critical to identify weakness and strengths of Tier 1 supports and students who may need additional Tier 2 or Tier 3 supports.

Tier 2

Tier 2 supports are designated for the 10-15% of students who require more support for following the schoolwide expectations than the general student population and who do not respond to Tier 1 supports alone (Sugai & Horner, 2002). Tier 2 supports are implemented in conjunction with Tier 1 (Sugai & Horner, 2002). Students who need Tier 2 support are identified through data collected in Tier 1, schoolwide screeners, and/or teacher nominations (Hawken et al., 2009). At Tier 2, the intensity of supports increases (Horner & Sugai, 2015) and the focus of the interventions is to increase appropriate behaviors through explicit teaching (Anderson & Borgmeier, 2010). Tier 2 interventions are evidence-based and research-based practices focused on improving socially appropriate behaviors that are time and resource efficient to implement (Hawken et al., 2009; Sugai & Horner, 2009). Most Tier 2 interventions have the flexibility for adjustment or modification based on the function of a student's behavior (Hawken et al., 2009), which is important because function-based interventions are more effective than nonfunction-based interventions (Newcomer & Lewis, 2004). Typical Tier 2 interventions include Check & Connect, First Steps to Success, Social Skills Training, and Check-In/Check-Out (CICO), also called Behavior Education Program (Hawken et al., 2009).

Tier 2 has five defining characteristics (Sugai & Horner, 2009). First, Tier 2 is guided by the SWPBIS team (Sugai & Horner, 2009). Teachers do not unilaterally make decisions about Tier 2 interventions. There is a coordinated, schoolwide approach to Tier 2. Second, Tier 2 is connected to schoolwide expectations (Sugai & Horner, 2009). Tier 1 is the foundation for Tier 2 supports. Third, frequent data analysis is used to identify students who need Tier 2 support and to monitor the effectiveness of supports for students who receive Tier 2 supports (Anderson & Borgmeier, 2010). The intensity and frequency of data collection and analysis increases in Tier 2 (Hawken et al., 2009; Sugai & Horner, 2009). Sources of data at Tier 2 may include attendance, tardies, or points received on a daily progress report (DPR) for students receiving CICO (Hawken et al., 2009). Fourth, Tier 2 supports include regular communication between the student, parent, faculty, and administration to support student behavior (Sugai & Horner, 2009). Fifth, Tier 2 interventions emphasize the use of reinforcement procedures (Sugai & Horner, 2009). These interventions also include prompting for students to display appropriate behavior and frequent opportunities to practice appropriate behaviors (Anderson & Borgmeier, 2010).

Tier 3

Although most students will respond to Tier 1 alone or Tier 1 and Tier 2 supports, approximately 5-10% of students will need additional, intensive supports (Sugai & Horner, 2002). Tier 3 supports are designated for the students with the most intensive behavioral needs, regardless of special education eligibility status or category (Horner & Sugai, 2015). Tier 3 supports are highly individualized (Sugai & Horner, 2009) and require significant time, resources, and training (Scott et al., 2009). Tier 3 supports require a team-based approach that typically involves conducting a functional behavior assessment (FBA) and developing an individualized, function-based behavior intervention plan (BIP; Scott et al., 2009; Sugai &

Horner, 2009). The focus of the BIP is teaching and reinforcing replacement behaviors (Scott et al., 2009). Tier 3 supports also may include wraparound services (Eber et al., 2011). Wraparound services are supported by a multidisciplinary team who assists a student and their family with coordinating a comprehensive support plan to meet the student's goals (Eber et al., 2011). Interventions, such as BIPs, counseling, and medical services, and other activities, such as childcare and mentoring, are part of a wraparound service support plan (Eber et al., 2011).

In summary, SWPBIS is a multitiered framework to support the behavior of all students (George et al., 2009; Horner & Sugai, 2015; Mitchell et al., 2018; Sugai & Horner, 2006, 2009) in which data-based decisions and evidence-based practices are central (Sugai & Horner, 2009). Although the tiered supports increase in intensity, all are built on a Tier 1 foundation (Sugai & Horner, 2009).

Origins of SWPBIS

SWPBIS was developed in response to schools lacking a systematic way to implement effective behavior management techniques and a need to improve students' behaviors in schools (Horner & Sugai, 2015). SWPBIS is rooted in applied behavior analysis (ABA; Horner & Sugai, 2015). ABA is the study of behavior and "the variables which can be effective in improving the behavior under study" (Baer et al., 1968, p. 91). Traditionally, ABA focuses on the individual as the unit of analysis, whereas the SWPBIS framework provides a structure for ABA to be applied at a socially significant level with the school as the unit of analysis for behavior change (Horner & Sugai, 2015). According to Horner and Sugai (2015), SWPBIS incorporates many concepts based on ABA, such as operationally defined behaviors, reinforcement, and manipulation of environment to change behavior. Additionally, SWPBIS adheres to the seven dimensions of ABA (Anderson & Kincaid, 2005; Baer et al., 1968; Horner & Sugai, 2015).

Baer and colleagues (1968) identified seven defining dimensions of ABA; that is, ABA is applied, behavioral, analytical, conceptually sound, effective, technological, and generalizable. SWPBIS fits all seven dimensions of ABA (Anderson & Kincaid, 2005; Horner & Sugai, 2015). First, SWPBIS is behavioral. Behavioral implies that the behavior of concern is observed and measured to determine if behavior changed and whose behavior changed (Baer et al., 1968). Within a SWPBIS framework, the SWPBIS team determines schoolwide expectations and operationally defines appropriate behaviors aligned for each expectation. Data are collected within implementation of the framework and of interventions across tiers by collecting data on observed behaviors. Additionally, data are taken across the tiers by teachers on student behavior based on direct observations (Anderson & Kincaid, 2005). If data indicate the need for additional or different support, the SWPBIS team operationally defines the challenging behaviors the student displayed and the appropriate replacement behaviors to be taught. Second, SWPBIS is applied. Applied means the behavior of study is important to society and the individual, not just theory or research (Baer et al., 1968). SWPBIS focuses on improving socially significant behaviors of all students in a school to improve the school climate and meet individual student needs (Anderson & Kincaid, 2005; Horner & Sugai, 2015). Third, SWPBIS is analytic (i.e., researchers can demonstrate that SWPBIS is responsible for behavior change with a causal-effect relation). Several research teams have documented the effectiveness of SWPBIS in increasing students' appropriate behaviors and decreasing students' challenging behaviors (Horner et al., 2010). Additionally, one of the key features of SWPBIS is data-based decisions. The need for support and the effectiveness of the supports in place is determined by data (e.g., ODR, suspension rates, direct observation, implementation fidelity); data help researchers and practitioners determine if a functional, causal-effect relation exists between SWPBIS

implementation and desired outcomes. Fourth, SWPBIS is conceptually sound in that it is data-driven, based on behavioral principles, and adapted to ensure the expectations and supports at all tiers are research-based and contextually appropriate for the school and community (Anderson & Kincaid, 2005; Horner & Sugai, 2015). Furthermore, the interventions within each tier are based on behavior analytic principles (e.g., reinforcement, contingency contracts). Fifth, SWPBIS is effective to produce socially significant changes in behavior (Baer et al., 1968). With its effectiveness being documented in numerous empirical studies (e.g., Bradshaw et al., 2008; Horner et al., 2009; Kim et al., 2018; Ross et al., 2012), educators, students, and families find SWPBIS effective to change school climate and student behavior on a socially significant scale. Research also has shown that SWPBIS is an evidence-based framework (Horner et al., 2010; Mitchell et a., 2018) that can lead to decreased use of exclusionary practices (e.g., ORDs, suspension; Gage et al., 2018; Noltemeyer et al., 2019) and increased academic achievement (Noltemeyer et al., 2019). Sixth, SWPBIS is technological (i.e., implementation can be replicated to produce the same results; Baer et al., 1968; Horner et al., 2010). SWPBIS is implemented in over 27,000 schools across the United States (Center on PBIS, 2018). Although the specific evidence-based interventions across tiers may vary across schools, the key components of SWPBIS are clearly defined and can be replicated across settings. Researchers have replicated the implementation of the SWPBIS framework across settings with similar positive changes in student behavior (Horner et al., 2010). Additionally, SWPBIS is a system to support implementation fidelity of behavior analytic interventions, which increases educators' ability to implement evidence-based practices across all tiers to replicate findings in research (Anderson & Kincaid, 2005). Finally, SWPBIS has generality (Anderson & Kincaid, 2005) in that SWPBIS is

sustainable overtime and effective across settings (Anderson & Kincaid, 2005). Further, changes in behavior are supported across all school settings within a SWPBIS framework.

In conclusion, SWPBIS was developed in response to a need to improve students' behaviors in schools, and it is rooted in the field of ABA (Horner & Sugai, 2015). Traditionally, ABA focuses on improving socially significant behaviors for individuals (Baer et al., 1968). SWPBIS applies the principles of behavior analysis on a large scale to effectively address socially significant behaviors on a socially significant scale with school being the unit of analysis (Horner & Sugai, 2015).

Effectiveness of SWPBIS

Since the 1990s, researchers have investigated the effectiveness of SWPBIS on student behavior and schools' disciplinary practices (e.g., Taylor-Greene et al., 1997). Over the years, SWPBIS has shown to be an evidence-based framework (Horner et al., 2010; Mitchell et al., 2018) with significant empirical support from individual studies and meta-analyses.

Individual Studies

Several studies provide support for the effectiveness of SWPBIS. Specifically, SWPBIS has brought a positive impact on school climate (Bradshaw et al., 2009; Horner et al., 2009; Simonsen et al., 2010; Wassdrop et al., 2012), teachers' wellbeing (Kelm & McIntosh, 2012; Ross et al., 2012), and students' challenging behavior (Bradshaw et al., 2012; Kim et al., 2018).

School Climate. SWPBIS can improve overall perceived school climate (Bradshaw et al., 2009). For example, Bradshaw and colleagues (2009) conducted a longitudinal survey to investigate the effects of SWPBIS on perceived school climate. Staff members (n = 2,507) from 37 elementary schools participated in the survey. Twenty-one of the schools received training in implementing SWPBIS across the 3-year period. For 3 years, school staff completed annual

surveys on their perceived organizational health of the schools. Data from their analysis indicated implementation of SWPBIS was related to significant increases in resource influence, staff affiliation, and academic emphasis.

Moreover, schools implementing SWPBIS may be less likely to use physical restraint (Simonsen et al., 2010). Simonsen and colleagues (2010) conducted a 3-year case study to investigate the effects of SWPBIS on serious behavior incidents, physical restraint, and elopement in an alternative school setting for students with disabilities. During baseline, only Tier 2 and Tier 3 supports were in place. During intervention, Tier 1 support was added. Data indicated there was a decrease in serious behavior incidents, use of physical restraint, and elopement with the addition of Tier 1 supports across the 3 years.

Finally, schools implementing SWPBIS may be perceived as safer when compared to schools without SWPBIS implementation (Horner et al., 2009). Using a randomized, wait-list controlled effectiveness trial, Horner and colleagues (2009) investigated the effects of SWPBIS on perceived school safety and academic achievement. The study included 33 schools in the treatment group and 30 schools in the control/delay group. The schools represented students from a diverse population across Illinois and Hawaii. Yearly, researchers measured SWPBIS implementation using the School-Wide Evaluation Tool (SET; Sugai et al., 2001), perceived school safety through staff survey, and third grade reading achievement on end-of-year tests. Local state leaders provided training and support for implementation of SWPBIS to schools in the treatment group. Data indicated there was a statistically significant difference in perceived school safety between staff at schools in the treatment group and staff at schools in the control group with the treatment group viewing their schools being safer.

The studies above support that SWPBIS can have a positive impact on school climate. Studies have shown SWPBIS increased the perception of the overall school climate (Bradshaw et al., 2009), decreased the use of physical restraint (Simonsen et al., 2010), and improved perceived school safety (Horner et al., 2009).

Teacher Wellbeing. In addition to the positive impact on school climate, SWPBIS can have a positive effect on factors related to teacher wellbeing, such as self-efficacy and burnout. For example, Kelm and McIntosh (2012) conducted a survey of teachers in a rural school district in Western Canada to examine differences in perceived self-efficacy between teachers who worked in schools implementing SWPBIS and teachers who work in schools that did not implement SWPBIS. Of the 62 teachers who completed the self-efficacy questionnaire, 22 worked in schools implementing SWPBIS and 40 did not. Analysis of the data indicated there was a statistically significant difference in ratings of self-efficacy between teachers who worked in schools implementing SWPBIS and teachers who did not. Overall, teachers working in schools implementing SWPBIS rated their self-efficacy higher than teachers who work in schools that did not implement SWPBIS.

Furthermore, SWPBIS may have a positive impact on teacher burnout. Ross and colleagues (2012) conducted a survey of 184 teachers in 40 elementary schools across Oregon to examine the differences in perceived teacher wellbeing between teachers working in schools implementing SWPBIS and teachers working in schools that did not implement SWPBIS. Teachers completed a 54-item survey that included questions related to demographics, teaching experiences, and stress and burnout. Data indicated there was a significant relationship between SWPBIS implementation and teacher's perceived self-efficacy and burnout. Additionally, teachers in low socioeconomic schools appeared to benefit most from SWPBIS.

The above research suggests that SWPBIS can have a significant impact on teacher wellbeing (Kelm & McIntosh, 2012; Ross et al., 2012). Specifically, teachers working in schools implementing SWPBIS reported higher self-efficacy and lower burnout compared to teachers who work in schools without SWPBIS implementation.

Student Behavior. The most substantial research of SWPBIS addressed its positive effects on student behavior, as shown by data on ODRs, suspension rates (Bradshaw et al., 2010; Kim et al., 2018), and teacher reported levels of students' challenging behavior (Bradshaw et al., 2012). Bradshaw and colleagues (2010) investigated the effects of SWPBIS on suspensions and ODRs using a 5-year longitudinal randomized controlled effectiveness trial design. Of the 37 public elementary schools included in the study, 21 received training and support over 5 years to implement SWPBIS. Yearly, researchers collected suspension rates and number of ODRs from schools implementing SWPBIS. Across the 5 years, there was a significant decrease in ODRs and suspension rates in schools implementing SWPBIS. Kim et al. (2018) provided further support on the effectiveness of SWPBIS on suspension rates and ODRs. Kim and colleagues conducted a correlational study to determine the correlation between SWPBIS implementation and student behavior outcomes (i.e., ODRs, suspension rates). Researchers analyzed implementation fidelity data, ODR rates, and out-of-school suspension rates across 3 years from 477 schools in 10 states. Data indicated a statistically significant decrease in ODRs and suspension rates across the 3 years of SWPBIS implementation.

In addition, SWPBIS can lead to decreased student challenging behavior based on teacher report. Using a group randomized controlled effectiveness trial design, Bradshaw and colleagues (2012) investigated the effects of SWPBIS on students' challenging behavior. Of the 37 public elementary schools included in the study, 21 received training and support over 4 years to

implement SWPBIS. Five times over the 4 years, researchers mailed surveys to teachers. Teachers completed a survey on the levels of challenging behavior for each student in their classroom. Data indicated a statistically significant difference in prosocial behaviors, concentration problems, disruptive behavior, and emotional regulation between students who attended schools that implemented SWPBIS and students who attended schools that did not implement SWPBIS. Overall, teachers reported more prosocial behaviors, better emotional regulation, less concentration problems, and less disruptive behavior for students who attended schools that implemented SWPBIS.

Furthermore, Waasdrop and colleagues (2012) conducted a randomized control trial to investigate the effects of SWPBIS on bullying behaviors across 37 public schools. Of the 37 schools, 21 received training and support to implement SWPBIS, and 16 were assigned to a comparison group. Over the course of 5 years, teachers completed a yearly checklist on bullying-related behaviors for each student in their class. Results indicated students who attended schools implementing SWPBIS displayed significantly fewer bullying behaviors than students who attended schools that did not implement SWPBIS.

Recently, Gage et al. (2019) investigated the effects of SWPBIS on (a) corporal punishment, (b) in-school suspension, (c) out-of-school suspension, (d) expulsion, (e) referral to law enforcement, and (f) school-related arrest. They included 1,186 schools in Florida: 593 schools implementing SWPBIS with fidelity and 593 schools that were not implementing SWPBIS. The sample consisted of elementary schools (71%), middle schools (19%), and high schools (9%). They matched schools implementing SWPBIS with fidelity with schools not implementing SWPBIS based on 12 school-level demographics (e.g., enrollment, location, percentage of students receiving free and reduced lunch, race/ethnicity). Data from statistical

analyses indicated rates of corporal punishment and involvement of law enforcement was low across both groups. However, schools that implemented SWPBIS reported significantly fewer out-of-school suspensions than schools that did not implement SWPBIS. Additionally, students with disabilities and Black students who attended schools that implemented SWPBIS had significantly fewer out-of-school suspensions than students with disabilities and Black students who attended schools that did not implement SWPBIS.

In summary, SWPBIS can have a significant impact on student behavior (Bradshaw et al., 2010, 2012; Kim et al., 2018; Wassdrop et al., 2012). Schools implementing SWPBIS reported lower rates of suspension, fewer ODRs (Bradshaw et al., 2010; Gage et al., 2019; Kim et al., 2018), and teachers reported reduced levels of challenging behavior (Bradshaw et al., 2012).

Reviews and Meta-Analyses

Several reviews or meta-analyses exist that determined the evidence base of SWPBIS. Horner et al. (2010) reviewed a sample of literature to examine the evidence base of SWPBIS. Their search included studies that were published between the years of 2000 and 2009 that experimentally investigated the effectiveness of SWPBIS or its components. Forty-six articles met their inclusion criteria. Of the 46 articles, 20 focused on Tier 1, 13 focused on Tier 2, and 13 focused on Tier 3. Horner et al. summarized the information from the 46 articles related to the following quality indicators: (a) “practices and participants [were defined] operationally,” (b) “research employ[ed] valid and reliable measures,” (c) “research [was grounded] in rigorous designs,” (d) “research document[ed] experimental effects without iatrogenic outcomes,” and (e) “research document[ed] effects” (Horner et al., 2010, p. 7). Data from their analysis indicated that SWPBIS is an evidence-based framework to support the behavior of all students.

Building on the work of Horner and colleagues (2010), Chitiyo et al. (2012) conducted a review of literature to examine the evidence base of SWPBIS. Their search included studies that were published between the years of 1990 and July 2011 that implemented Tier 1 supports for all students in a school. Thirty-four studies met their inclusion criteria. Chitiyo et al., coded the articles for quality indicators as outlined by Horner et al. (2010). Chitiyo et al.'s review differed from Horner et al. study, because Horner et al. applied the quality indicators to the overall literature base, whereas Chitiyo et al. applied the quality indicators to each individual study. The researchers eliminated 24 of the studies, because they did not use a rigorous design. Of the remaining 10 studies, seven showed positive effects of SWPBIS on behavioral and academic outcomes (e.g., ODRs, suspensions, reading achievement, bullying behaviors). However, only two studies met all quality indicators. Therefore, Chitiyo et al. identified SWPBIS with Tier 1 support as a promising practice to support the behavior of students.

In addition, Mitchell et al. (2018) conducted a review of literature to examine the evidence base of SWPBIS. Their search included studies that (a) were published in English in a peer-reviewed journal, (b) used an experimental or quasi-experimental group design, and (c) provided training to implement SWPBIS without a limit on publication year. Twelve manuscripts reporting five studies met the inclusion criteria. Then, Mitchell et al. applied the What Works Clearinghouse (WWC) and The Council for Exceptional Children (CEC) standards to evaluate the quality of the research. Four of the five studies met the WWC standards without reservation. Three of the four studies had positive interventions effects on school climate, staff perceptions, and/or student behavior. Mitchell et al. concluded SWPBIS is an evidence-based framework based on the WWC standards. None of the studies met the CEC standards.

In another study, Gage et al. (2018) conducted a review of literature to examine the effects of SWPBIS on disciplinary exclusion. Their search included studies conducted prior to 2018 that met four criteria: (a) the study used a group quasi-experimental or randomized control trial design, (b) the independent variable was SWPBIS, (c) the dependent variable was at least one form of disciplinary exclusion (i.e., ODR, suspension, expulsion), and (d) the school was the unit of analysis. Four studies met their inclusion criteria. Across the four studies, SWPBIS had a statistically significant effect on school suspensions. Additionally, schools implementing SWPBIS had lower ODR rates, but this was not statistically significant across the four studies.

More recently, Noltemeyer et al. (2019) conducted a review of literature to examine the impact of SWPBIS on ODRs, suspension, and academic achievement. Their search included studies conducted between the years of 1990 and 2018 that documented impact of SWPBIS with an outcome variable and were conducted in PreK-12 schools using a conceptually sound research design. Fifty studies met their inclusion criteria. Over 90% of studies had a unanimously positive or predominately positive effect on ODRs. Approximately 75% of studies had a unanimously positive or predominately positive effect on suspension. Additionally, 27.3% of studies had a unanimously positive or predominately positive effect on student achievement.

Finally, Lee and Gage (2020) conducted a review of literature and meta-analysis to analyze the effects of SWPBIS on school level variables (e.g., school discipline, academic achievement). Their search included group experimental and quasi-experimental design studies conducted in K-12 public schools with outcome variables assessed at the school level. Twenty peer-reviewed studies and 12 dissertations met their inclusion criteria. Results showed that there was a statistically significant reduction in school discipline and a statistically significant increase in academic achievement across the studies with small to medium effect sizes.

The aforementioned reviews and meta-analyses supported the effectiveness of SWPBIS. SWPBIS is an evidence-based framework (Horner et al., 2010; Mitchell et al., 2018) that can lead to decreases in exclusionary practices, such as ODRs, suspension, and expulsion in PreK-12 settings (Gage et al., 2018; Noltemeyer et al., 2019; Lee & Gage; 2020).

SWPBIS and Students with ESN

Although SWPBIS is designed to support the social and behavioral needs of all students, especially those with disabilities, (George et al., 2009; Horner & Sugai, 2015; Lewis et al., 2016; Mitchell et al., 2018; Positive Behavioral Interventions and Supports, 2019; Sugai & Horner, 2006, 2009), students with ESN are not always considered and included in SWPBIS (Kurth & Enyart, 2016; Kurth & Zagona, 2018; Walker et al., 2018). In 2006, the journal of the Association for Persons with Severe Handicaps (TASH), *Research and Practice for Persons with Severe Disabilities* (*RPSD*), released a special issue on the inclusion of students with ESN in SWPBIS. There was a growing concern in the TASH community that students with ESN were being left out as there was a shift in research and practice from individualized positive behavioral supports to SWPBIS (Bambara et al., 2006). In response to this concern, *RPSD* published a special issue that included four feature articles on the inclusion of students with ESN by experts in students with ESN, individualized positive behavioral supports, and SWPBIS (Bambara et al., 2006). This special issue was intended to act as a call to action for researchers; however, very few researchers responded to this call. Ten years later, Kurth and Enyart (2016) examined the state of research on SWPBIS and students with ESN. Kurth and Enyart stated the research on including students with ESN in SWPBIS was still limited and highlighted the need for research to assess the appropriateness of SWPBIS for students with ESN, the availability and accessibility of SWPBIS to students with ESN, and the effects of SWPBIS on inclusion for these students.

Current State of Including Students with ESN in SWPBIS

Several research teams have explored the state of inclusion for students with ESN in SWPBIS. Collectively, researchers have collected data through surveys to determine (a) if students with ESN were included in SWPBIS, (b) if students with ESN were considered when planning for implementation of SWPBIS, and (c) perceived barriers to including students with ESN in SWPBIS. In an earlier study, Landers and colleagues (2012) conducted a survey of SWPBIS coordinators on their beliefs and perceptions of including students with ESN in SWPBIS. Fifty-one PBIS state coordinators completed the survey that consisted of five questions about the number of schools supported, planning procedures, and inclusion of students with ESN in planning. Data indicated most coordinators (93%) agreed students with ESN can participate at least partially in SWPBIS; however, only 12% of state coordinators indicated they discussed students with ESN and strategies for inclusion in SWPBIS in planning meetings. This suggests that, although state coordinators believe students with ESN can participate in SWPBIS, they often do not consider their needs when planning for implementation. As a result, all tiers of support may not be accessible to students with ESN.

Building upon the work of Landers and colleagues (2012), Walker and colleagues (2018) conducted a survey of 179 elementary schools across the country to investigate the accessibility of SWPBIS to students with ESN. All schools had students with ESN included in the school population. One SWPBIS team member from each school completed the 26-item survey that included questions about school characteristics, frequency of inclusion of students with ESN in SWPBIS, level of importance of including students with ESN in SWPBIS, and perceived barriers to including students with ESN in SWPBIS. Respondents placed high importance on including students with ESN in teaching schoolwide expectations, and 61.5% of respondents reported their

schools always included students with ESN in teaching schoolwide expectations. However, schools where students with ESN were more likely to receive instruction in general education settings rated the importance of teaching schoolwide expectations to students with ESN and of posting expectations that are accessible to all students statistically significantly higher than schools where students with ESN were more likely to be taught in self-contained settings. Conversely, respondents reported low ratings for both implementation and importance of considering students with ESN for Tier 2 supports. Additionally, schools where students with ESN were more likely to receive instruction in general education settings were more likely to consider students with ESN for Tier 2 supports and to provide public acknowledgement for students with ESN who adhered to schoolwide expectations. Finally, respondents reported barriers to including students with ESN in SWPBIS. Barriers included (a) perceived student competency needed to understand expectations and reinforcement systems, (b) low expectations and negative staff perceptions, (c) lack of resources, (d) lack of administrative support, and (e) lack of inclusive opportunities.

Additionally, Shuster and colleagues (2017) conducted a survey to investigate the inclusion of special educators and students with disabilities in SWPBIS. The survey consisted of 46 four-point Likert-scale items about their schools' SWPBIS implementation, their involvement in SWPBIS, and their students' involvement in SWPBIS. The survey also included an additional 27 four-point Likert-scale items about their possible access to professional development opportunities related to SWPBIS and interest in further professional development related to SWPBIS. Eight hundred forty-nine special educators in schools implementing SWPBIS and schools not implementing SWPBIS in Tennessee completed the survey. The special educators reported variable levels of involvement in SWPBIS for students with disabilities. However,

involvement in SWPBIS for students with low incidence disabilities (i.e., ESN) was statistically significantly lower than involvement of students with high incidence disabilities.

Similarly, Kurth and Zagona (2018) conducted a survey to investigate SWPBIS coaches' perspectives on the inclusion and involvement of students with ESN. The survey consisted of questions about involvement of school personnel on the SWPBIS team, participation of students with ESN in general education, and involvement of students with ESN in SWPBIS. Three hundred and five coaches completed the survey. Data indicated that coaches who indicated students with ESN were primarily taught in special education classrooms rated the importance of involving students with ESN in SWPBIS as lower than coaches who indicated students with ESN were primarily taught in general education classrooms. Coaches who were general educators often reported being unsure of the level of participation of students with ESN in SWPBIS. Moreover, general educators were less involved in (a) providing rewards to, (b) teaching expectations to, and (c) managing behavior of students with ESN.

In addition to the above survey studies of SWPBIS coordinators, coaches, and special educators, researchers have examined SWPBIS evaluation tools to determine the degree of inclusiveness of all students. Kurth and colleagues (2017) conducted a content analysis of commonly used SWPBIS evaluation tools to determine the inclusiveness of students with ESN in the tools. After completing a literature review to determine the most commonly used SWPBIS evaluation tools, the researchers examined the (a) School-wide Evaluation Tool (SET) version 2.1 (Sugai et al., 2004), (b) SET manual version 2.0 (Todd et al., 2012), (c) Team Implementation Checklist (TIC) version 2.1 (Sugai et al., 2012), and (d) Benchmarks of Quality (BOQ) Scoring Form, BoQ Scoring Guide, and BoQ Team Member Rating (Kincaid et al., 2010) for evidence of consideration of students with ESN using key search terms (e.g., all students, all

teachers, inclusion, self-contained, low-incidence, severe, significant). Data indicated these fidelity tools do not necessarily require all students to be included directly in all components of SWPBIS. For the school to receive the highest marks for implementation on the tools, only most students and staff need to be included in key components, such as teaching expectations and using the reward system appropriately. According to Kurth et al. (2017), these phrases could be used as loopholes to not include students with ESN.

Despite the perceived barriers and less than full inclusiveness of all students in SWPBIS evaluation tools, there is agreement among experts that students with ESN should be included in all tiers of SWPBIS. Zagona et al. (2021) conducted a survey to investigate SWPBIS experts' perspectives on including students with ESN in SWPBIS. Twenty-four participants, who were members of the *Journal of Positive Behavior Interventions* editorial board, completed the 23-question survey that included demographic questions and questions about SWPBIS and inclusion of students with ESN in SWPBIS. Data indicated experts agreed that schoolwide expectations should be posted in a way that is assessable to students with ESN in all areas, including self-contained special education classrooms. Additionally, all experts agreed that school teams should develop and implement a plan to teach expectations to students with ESN, with many noting accommodations and modifications will be necessary. Experts also agreed that students with ESN should be included in all tiers of SWPBIS.

In addition to understanding perceptions from educators and SWPBIS experts, researchers have explored the degree to which schools have included students with ESN in SWPBIS. Walker and colleagues (2020) conducted a qualitative study to investigate how students with ESN were included in SWPBIS, specific strategies for including students with ESN in SWPBIS, and barriers to inclusion. Researchers conducted semi-structured interviews with 15

people (i.e., one special educator, one general educator, and one administrator in each school) from five elementary schools in North Carolina implementing SWPBIS with fidelity. Participants reported including students with ESN in (a) teaching schoolwide expectations, (b) the schoolwide recognition system, and (c) consideration for Tier 2 supports. Many participants mentioned the accessibility and accommodations made in special education settings. However, few participants mentioned increased accessibility across all settings for students with ESN. Specific strategies for enhancing inclusion in SWPBIS included time in inclusive settings (e.g., special area classes) and visual supports. Additionally, some respondents reported the use of adapted lesson plans with (a) simplified language, (b) multiple opportunities to practice, (c) modeling, and (d) prompting. Finally, participants reported student characteristics and low expectations as barriers to participation.

Effectiveness of Including Students with ESN in SWPBIS

Although there is limited data to support the effectiveness of including students with ESN in SWPBIS, the existing data suggest including students with ESN in SWPBIS may have a positive impact on their challenging behavior. In a recent study, using a multiple probe across participants design, Loman and colleagues (2018) investigated the relation between adapted Tier 1 lesson plans using Universal Design for Learning (UDL) on the duration of challenging behavior of two students with ASD who had ESN and one student with intellectual disability who had ESN at three elementary schools implementing SWPBIS. During intervention, teachers implemented the adapted Tier 1 lesson plans. During the lessons, teachers (a) identified and read the behavior expectation poster to the students, (b) modeled behaviors, (c) prompted students to demonstrate the appropriate behavior, and (d) provided reinforcement when the students displayed the appropriate behavior. The lessons took 5 min and were implemented in a one-to-

one format until the students had no more than two behavioral incidents per session for 2 consecutive days. Data indicated a functional relation between the adapted lesson plans and the reduced duration of challenging behavior for all three students.

In conclusion, although schools are attempting to include students with ESN in SWPBIS (Walker et al., 2020), SWPBIS leaders do not always consider students with ESN in SWPBIS when planning for implementation (Landers et al., 2012; Walker et al., 2018). This could be due to low expectations for students with ESN (Walker et al., 2018, 2020), student characteristics (Walker et al., 2018, 2020), or the physical separation of students with ESN in school (Kurth & Zagona, 2018). To date, there is very limited research suggesting students with ESN may benefit from less time and resource intensive interventions (i.e., Tier 1 or Tier 2 supports) within a SWPBIS framework (Loman et al., 2018), and more research is warranted.

Summary

SWPBIS is a multitiered framework that supports the social and behavioral needs of all students, especially those with disabilities (George et al., 2009; Horner & Sugai, 2015; Mitchell et al., 2018; Positive Behavioral Interventions and Supports, 2019; Sugai & Horner, 2006, 2009). SWPBIS is an evidence-based framework (Horner et al., 2010; Mitchell et al., 2018) with significant empirical support and has shown to positively affect the school climate (Bradshaw et al., 2008; Horner et al., 2009; Simonsen et al., 2010; Wassdrop et al., 2012), improve teacher wellbeing (Kelm & McIntosh, 2012; Ross et al., 2012), and decrease students' challenging behavior (Bradshaw et al., 2010, 2012; Kim et al., 2018). However, students with ESN are not always included in SWPBIS implementation (Kurth & Zagona, 2018; Landers et al., 2012; Walker et al., 2018). This could be because SWPBIS school-based leaders have low expectations for students with ESN and perceive student characteristics as barriers (Walker et al., 2018, 2020).

The physical and programmatic separation of students with ESN in school also could contribute to a lack of inclusion of students with ESN in SWPBIS (Kurth & Zagona, 2018). Limited empirical research suggests including students with ESN in SWPBIS can result in reduced challenging behavior (Loman et al., 2018) and more research will be essential.

Check-In/Check-Out

Check-In/Check-Out (CICO), also known as the Behavior Education Program (Crone et al., 2010, Hawken et al., 2007, 2015), is an evidence-based practice commonly used as a Tier 2 behavioral support within the SWPBIS framework (Conley et al., 2018; Maggin et al., 2015). CICO involves consistent feedback and rewards in combination with a contingency contract (Crone et al., 2010; Hawken & Horner, 2003) to increase appropriate behaviors, decrease challenging behaviors, and improve school-home communication for students with challenging behavior (Hawken & Horner, 2003). CICO is intended for use with students who do not respond to Tier 1 supports and is most appropriate for students who display frequent, but not severe, challenging behavior (Crone et al., 2010).

CICO is efficient and easy for school staff to implement (Conley et al., 2018; Crone et al., 2010; Rodriguez et al., 2015). After initial training, it takes mentors and teachers 5-10 min per day to implement (Crone et al., 2010). Because CICO can be implemented efficiently with limited time and resources, it can support up to 15% of the student population (Conley et al., 2018). Considering the efficiency of an intervention is important because, in some classrooms, students display challenging behavior frequently throughout the school day (e.g., at least once per minute in elementary schools; Owens et al., 2018). Teachers need an effective and efficient intervention that can address challenging behavior of many students.

CICO involves a six-step process (Crone et al., 2010; Hawken et al., 2007, 2011). First, the student checks in with a mentor upon arrival to school. The mentor can be any staff member of the school except the student's primary teacher. Ideally, the student would have a positive relationship with the mentor before starting CICO. During the check-in meeting, the student receives a daily progress report (DPR). The DPR lists the schoolwide expectations and points the student can earn for each expectation during each class period of the day. The DPR is used throughout the day for the student to receive feedback and track points. The mentor also ensures the student has all the materials needed for the day and briefly reminds the student of their point goal for the day. Second, the student gives the DPR to the teacher for recording student performance. Third, the teacher provides feedback to the student at designated intervals throughout the day and marks points earned on the DPR. Fourth, the student brings the DPR to check out with the mentor at the end of the day. During this meeting, the mentor discusses with the student their behavior based on the behavior ratings on the DPR. The student receives a reward for meeting the goal or constructive feedback when not meeting the goal. Fifth, the student brings the DPR home. Parents discuss the behavior ratings on the DPR with the student and sign it. Sixth, the student brings the signed DPR back to the mentor at check-in the next morning.

Contingency Contracts

CICO is based on a contingency contract (Crone et al., 2010). A contingency contract is an agreement between at least two people (e.g., mentor and student) that specifies the exact actions each person will take and the reward the student will get if the actions are completed (Cooper et al., 2020). Contingency contracts can be effective to increase students' appropriate behaviors and decrease students' challenging behavior (Bowman-Perrott et al., 2015; Crone et

al., 2010). Bowman-Perrott et al. (2015) conducted a meta-analysis to summarize single-case research on contingency contracts implemented to address behavior of children and youth. Studies included in the meta-analysis (a) used a single-case research design, (b) implemented a contingency contract to address challenging or academic behavior, (c) involved school-aged participants, and (d) were published between 1969 and 2013. Eighteen studies met their inclusion criteria. Data from effect size calculations indicated that contingency contracts had an overall moderate effect on challenging or academic behavior. There was no statistically significant difference in effectiveness across grade levels, gender, or disability groups (i.e., ASD, attention-deficit hyperactivity disorder, emotional and behavioral disorder, learning disability). CICO is based on a contingency contract and includes components of behavioral interventions, such as (a) differential reinforcement, (b) punishment, (c) feedback, (d) ongoing data collection, (e) self-monitoring, and (f) parental involvement. The sections below include a description of each of the components and relevant empirical studies supporting their effectiveness.

Differential Reinforcement

Differential reinforcement involves only providing reinforcement for responses that meet specific criteria and withholding reinforcement for responses that do not meet the criteria (Cooper et al., 2020). MacNaul and Neely (2018) conducted a literature review to summarize studies on differential reinforcement to address challenging behavior of students with ASD. Researchers included studies that (a) implemented differential reinforcement to address challenging behavior, (b) included at least one participant with ASD, (c) did not implement extinction procedures, (d) included a functional analysis to determine participants' function of behavior, and (e) were peer reviewed and published in English prior to 2016. Ten studies with 29 participants met their inclusion criteria. Nine of the 10 studies had positive effects of differential

reinforcement on challenging behavior among students with ASD. One component of CICO is the provision of differential reinforcement. Students earn rewards (i.e., presumably reinforcers) for following schoolwide expectations and meeting their point goals. Students do not earn rewards if they do not meet their point goals.

Punishment

Punishment is another component of CICO. Punishment involves the contingent removal or delivery of an undesired stimulus that results in a reduction of behavior (Cooper et al., 2020). Students who display challenging behavior and therefore do not meet their point goals may decrease their future engagement in the challenging behavior as a result of an absence of the rewards due to not meeting point goals. Additionally, unfavorable feedback from teachers, the mentor, or parents may also have a punishing effect.

Feedback

Feedback is another critical component of CICO. Feedback can decrease challenging behavior in future similar circumstances, because (a) feedback may act as a prompt for future behavior, (b) the provision of unfavorable feedback may be punishing, or (c) the provision of favorable feedback may be reinforcing (Cooper et al., 2020). Students who receive CICO receive feedback at designated intervals throughout the day from teachers, at the end of the day from their mentor, and at home from a parent (Crone et al., 2010).

Ongoing Data Collection

Another key feature of CICO is ongoing data collection (Crone et al., 2010). Ongoing data collection and analysis is critical to determine the effectiveness of the intervention, and it allows implementers to adjust or intensify supports to meet the students' needs (Cooper et al.,

2020; Rodriguez et al., 2015). With CICO, behavior data are collected daily across the entire school day using the DPR.

Self-management

Self-management is "the personal application of behavior change tactics that produces a desired improvement in behavior" (Cooper et al., 2020, p. 683). Self-management includes antecedent-based self-management strategies and self-monitoring (Cooper et al., 2020). Antecedent-based self-management involves manipulating the antecedent or motivating operation to increase the likelihood the person will engage in the desired behavior (Cooper et al., 2020). Self-monitoring "is a procedure whereby a person systematically observes his behavior and records the occurrence or nonoccurrence of a target behavior" (Cooper et al., 2020, p. 692). Self-management strategies can be implemented effectively to change an individual's behavior (Aljadeff-Abergel et al., 2020; Cooper et al., 2020). Aljadeff-Abergel et al. (2015) conducted a review of literature to analyze the effectiveness of self-management interventions for students with ASD. Researchers included studies published between 1970 and 2015 that included participants with ASD under 21 years old and focused on self-management strategies. Fifty studies met their inclusion criteria. Most of the studies were conducted in mixed (i.e., natural and clinical settings) or natural settings. Of the studies implemented in natural settings, 70% found self-management was an effective intervention. In CICO, the DPR can act as an antecedent-based self-prompt and a tool to self-monitor behavior in some instances. If the student is taught to use the DPR as a self-management tool, this can help increase students' awareness and ownership of their own behavior (Cooper et al., 2020; Swoszowski et al., 2017; Xu et al., 2017).

Parent Involvement

Parent involvement in school has been shown to increase students' engagement and performance in school (Mo & Singh, 2008). CICO can help increase school-home communication and encourage parent involvement (Hawken & Horner, 2003). CICO involves parents reviewing and signing the DPR daily, and potentially providing additional rewards at home (Crone et al., 2010).

Although CICO involves a contingency contract with differential reinforcement, punishment, feedback, ongoing data collection, self-monitoring, and parental involvement with each component being effective, it is unknown if all components are necessary for all students. Campbell and Anderson (2011) conducted a component analysis of CICO with four elementary students. All four students responded to CICO with all components implemented. Once the students met their point goals (i.e., 80%) for 15 consecutive days, the researchers worked with the school team to systematically fade the teacher feedback throughout the day and the point card. All four students continued to display low levels of challenging behavior and higher rates of engagement compared to baseline. However, teachers worried that the behavior would increase and reinstated the point card and some of the feedback sessions. Therefore, it is unknown if changes in behavior would have maintained. It is also unknown if students required all components before fading some of the components. In another study,
Miller at al. (2015b) investigated the effects of CICO systematically faded and replaced with self-monitoring for four elementary students who required Tier 2 intervention. The four students' academic engagement increased and challenging behaviors decreased during the CICO intervention. Changes in academic engagement and challenging behavior were maintained with self-monitoring. Data from Campbell and Anderson and Miller et al. suggest that all components

of CICO may be needed for initial behavior change, but changes in behavior may maintain with systematic fading for teacher feedback.

Training for CICO Implementation Fidelity

For CICO to be most effective, school staff should implement it with fidelity (Ruiz et al., 2014). Implementation fidelity refers to the extent to which all components of an intervention are implemented with adequate intensity, frequency, and duration (Keller-Margulis, 2012). Implementation fidelity is critical in determining the effectiveness of an intervention (Keller-Margulis, 2012). Additionally, researchers have found that implementation fidelity of behavioral interventions can affect student outcomes (Cook et al., 2012). To ensure implementation fidelity, it is important for researchers or consultants to provide training to school staff and parents before implementing CICO.

Training School Staff

School staff play a critical role in CICO implementation. First, some school staff will act as mentors, conducting the daily check-in and check-out meetings with the student. During the check-in, mentors will provide the DPR and review expectations. During the check-out, mentors will provide praise and a reward or constructive feedback based on student performance. Second, some school staff will score DPRs, give points, and give feedback throughout the day.

Despite the importance of implementation fidelity, school staff do not always implement CICO with high fidelity. Ruiz and colleagues (2014) conducted a descriptive study to assess implementation fidelity of CICO in elementary and middle schools. Ruiz et al. analyzed (a) daily implementation, (b) subject area consistency, (c) established point goals, (d) behavior goal consistency, and (e) score completion based on data gathered from 333 sets of DPRs collected from 20 elementary and 12 middle schools. Data indicated that overall elementary schools

implemented CICO with greater fidelity than middle schools. Elementary schools implemented consistently across subject areas 97% of time, whereas middle schools implemented consistently across subject areas 66% of the time. Additionally, elementary schools had greater consistency with point goals (93%) compared to middle schools (68%). Elementary and middle schools had similar rates of behavior goal consistency, 98% and 94%, respectively. However, both elementary (67%) and middle schools (54%) reported low rates of daily implementation.

To ensure implementation fidelity of CICO, researchers have employed various training models (e.g., didactic, experiential, train-the-trainer), and most data indicate training school staff resulted in higher implementation fidelity of CICO. For example, Sobalvaro and colleagues (2015) trained school staff to implement CICO in order to examine the effects of CICO on the challenging behavior of kindergarten students in an urban setting. The training involved instruction on the background, research, goals, and procedures of CICO, as well as how to complete the DPR and provide praise. One of the researchers provided teachers with a one-time training that included didactic training and practice with provision of verbal praise. School staff implemented the check-in 81.67% of the time, the check-out 78.22% of the time, and gave points and feedback 76.49% of the time. Implementation fidelity was greater when school staff received training than without training (Ruiz et al., 2014).

More recently, Karhu and colleagues (2018) trained school staff (i.e., teachers, teacher assistants, and members of the schools' behavior support teams) to implement CICO to examine the effects of CICO on the challenging behaviors of two elementary students with an attention-deficit hyperactivity disorder. Karhu and colleagues conducted a one-day training on the key components of CICO for school staff. The training was 6 hours and included instructions on identifying students who might benefit from CICO, key elements of CICO, and time to plan for

schoolwide implementation. Implementation fidelity from school staff was 88.7%, which was higher than the implementation fidelity reported by Sobalvaro and colleagues (2015).

In an alternative approach to training, Bunch-Crump and Lo (2017) used a train-the-trainer model (Shire & Kasari, 2014) to support an assistant principal in training teachers to implement CICO to examine the effects of CICO on disruptive behavior and academic engagement of four elementary students. Bunch-Crump and Lo conducted a short training (i.e., 20-30 min) with the assistant principal. The training included (a) explicit instruction on positive interactions, (b) steps to implement CICO, (c) an overview of the DPR, (d) how to use the DPR, and (e) role play. During the training, the assistant principal engaged in role play with the researchers until meeting the mastery (i.e., 100% implementation fidelity). The assistant principal then implemented a similar training with school staff involved in CICO implementation. Bunch-Crump and Lo conducted implementation fidelity checks for 51% of CICO sessions, and implementation fidelity for the study was 100%.

The above studies showed that researchers have used didactic (e.g., one-day workshops; Karhu et al., 2018) and experiential (e.g., coaching, role-play; Sobalvaro et al., 2015) training models to improve implementation fidelity of CICO by school staff. In most cases, researchers conducted the trainings for the school staff who would implement CICO. However, some researchers (e.g., Bunch-Crump & Lo, 2017) employed a train-the-trainer model (Shire & Kasari, 2014) where researchers trained a lead staff member who then trained school staff. Regardless of training procedures, implementation fidelity was higher with training supported by researchers (Bunch-Crump & Lo, 2017; Karhu et al., 2018; Ruiz et al., 2014; Sobalvaro et al., 2015).

Training Parents

At the end of each school day, students bring their DPR home for parents or caregivers to review and sign. Parents provide feedback and rewards to the student and sign the DPR (Crone et al., 2010). Parents should be trained on CICO to provide meaningful feedback to their child based on the DPR. Although research has shown the benefit of training and coaching for parents to implement behavioral practices (Piquero et al., 2014), the current CICO literature does not consistently reflect this practice. Specifically, some researchers have attempted to train parents in CICO with various degrees of effectiveness. For example, Sobalvaro and colleagues (2015) trained parents to implement the home component of CICO and examined the effects of CICO on the challenging behavior of kindergarten students in an urban setting. Researchers provided parents with a packet of information that explained CICO and provided tips and suggestions for feedback and reinforcement at home. This method of training appeared to be ineffective because parent implementation fidelity was 0%, despite researchers attempting to contact parents via phone and email throughout the intervention. None of the participants returned a signed DPR at any point during the study. Researchers suggested that in-person visits to the family to explain the intervention and their participation may increase their involvement.

In addition to providing parents with packet of information, some researchers chose to provide in-person training to parents. To examine the effects of CICO on the disruptive behavior and academic engagement of four elementary students, Bunch-Crump and Lo (2017) conducted training for parents to implement the home component of CICO. After the research team trained the assistant principal, the assistant principal conducted a short training (e.g., 20-30 min) with parents whose children were included in the study. Each parent training was conducted one-on-one with the assistant principal and included 20-30 min of instruction in the definition and

procedures of CICO, positive interactions, components of the DPR, and data collection. Additionally, the training included role play. The session ended when the parents/caregivers implemented the procedures with 100% accuracy during role play. The training was effective because implementation fidelity for CICO was 100%, which included parent signature on the DPR.

In conclusion, the current research on CICO that includes parent training is very limited. CICO research has included various training methods for parents, such as sending information home to parents (Sobalvaro et al., 2015), professional-development style training, and role-play (Bunch-Crump & Lo, 2017). The limited data showed in-person training for parents that involved didactic instruction and role play was effective in improving implementation fidelity (Bunch-Crump & Lo, 2017).

Effectiveness of Traditional CICO

When implemented with fidelity, research indicates the traditional six-step CICO is an effective intervention for students who display challenging behavior regardless of age or setting (Maggin et al., 2015). Specifically, CICO can decrease challenging behavior and increase appropriate behavior for students with high incidence disabilities and those without disabilities across elementary, middle, and high school settings (Ennis et al., 2012; Hawken et al., 2007; Simonsen et al., 2011). Additionally, CICO is effective in urban, suburban, and alternative schools (Ennis et al., 2012; Fallon et al., 2017; McCurdy et al., 2007; Simonsen et al., 2011).

Individual Studies

To investigate the effectiveness of traditional CICO, researchers have conducted studies in various settings with a diverse student population. Many of these studies were conducted in middle and high school settings. For example, Ennis and colleagues (2012) used a multiple

baseline across participants research design to evaluate the effects of CICO on the challenging behavior of six middle and high school students in a residential school for students with emotional disabilities. Three of the participants displayed challenging behavior maintained by peer attention, and the remaining three participants displayed challenging behavior maintained by escape. During intervention, school staff implemented CICO following the traditional six-step process. Results indicated a functional relation between CICO and reduction in the challenging behavior for the three students whose behavior was maintained by peer attention. Additionally, challenging behavior decreased for two of the three participants who displayed challenging behavior maintained by escape.

Simonsen and colleagues (2011) used a pre-test control group research design with random assignment to compare the effectiveness of CICO to the school's standard practice of sessions with the school counselor on the ODRs, scores on the *Social Skills Rating System* (SSRS; Gresham & Elliott, 1990), and on- and off-task behaviors of 42 students in an urban middle school. Of the 42 students, five received special education services. During intervention, school staff implemented the traditional six-step CICO process for 27 students. The remaining 15 students received sessions with the counselor, which was standard practice in the school. Although there was no statistically significant difference in SSRS ratings between the two groups, there was a statistically significant difference in ODRs and on- and off-task behavior between the CICO group and the standard practice group. Students who received CICO displayed less off-task behavior and had fewer ODRs.

In addition to examining effects of CICO in secondary schools, researchers have investigated the effects of traditional CICO in elementary settings. Hawken and colleagues (2007) used a multiple baseline design across groups of participants to evaluate the effects of

CICO on ODRs of 12 elementary students with challenging behavior in urban elementary schools implementing SWPBIS for at least 3 years. During intervention, school staff implemented CICO following the traditional six-step process. Data indicated a decrease in ODRs for nine of the 12 participants. Additionally, teachers, parents, and students indicated the CICO was a socially valid intervention related to time and effort. Teachers, parents, and students also agreed that CICO led to improved behavior at school.

In a follow-up study, Hawken and colleagues (2011) used a quasi-experimental pretest-posttest research design to evaluate the effectiveness of CICO on the ODRs of 17 students in two urban elementary schools. Both schools were implementing Tier 1 of SWPBIS with at least 70% fidelity prior to the researchers conducting the study. During baseline, teachers provided Tier 1 support (i.e., taught schoolwide expectations and provided verbal and tangible rewards for demonstrating behaviors related to expectations) to students. During intervention, school staff implemented CICO using the traditional six-step process. All students used a DPR based on schoolwide expectations. Data indicated a decrease in ODRs for 14 of the 17 students. Additionally, parents, teachers, and students rated CICO as worth the time and effort and stated they would recommend CICO to others.

In addition to measuring the effectiveness of CICO in reducing ODRs, researchers have measured the effectiveness of CICO on academic engagement and challenging behavior. For example, Miller and colleagues (2015) used a reversal design to evaluate the effects of CICO on the challenging behavior and academic engagement of three African American elementary school students. All participants attended schools implementing SWPBIS for at least 1 year prior to the start of the study. One of the participants had a learning disability, and the other two participants did not have a disability. During intervention, school staff implemented CICO

following the traditional six-step process. Researchers conducted direct observations of student behavior during the baseline and intervention conditions. Results indicated a functional relation between CICO and reduction in challenging behavior as well as increases in academic engagement for two of the three participants.

Overall, the aforementioned literature indicates the traditional six-step CICO is effective at decreasing challenging behavior and increasing appropriate behaviors for students with various characteristics in diverse settings (Ennis et al., 2012; Hawken et al., 2007, 2011; Miller et al., 2015a; Simonsen et al., 2011). However, in many cases, the traditional six-step CICO is not effective for all participants (Ennis et al., 2012; Hawken et al., 2007, 2011), suggesting a need for CICO adaptations (discussed later in this chapter).

Literature Reviews

In addition to individual study investigations, several literature reviews have been conducted to analyze and summarize the effectiveness of CICO. First, Maggin and colleagues (2015) conducted a review of intervention studies to examine the empirical support for CICO in reducing students' challenging behavior. Their search included studies that implemented CICO with and without adaptations prior to 2015. Maggin et al. included studies that (a) implemented CICO alone or in conjunction with other behavior supports, (b) included participants in kindergarten through 12th grade, (c) were conducted in a school setting, (d) targeted challenging behavior as the outcome variable, and (e) used an experimental or quasi-experimental group design or a single-case research design. Twenty-two studies met their inclusion criteria, including 17 single-case design studies and five group design studies. Maggin and colleagues evaluated each study for quality using the WWC standards. Data from their analysis indicated

there was a sufficient number of single-case studies to qualify CICO as an evidence-based practice.

Furthermore, Wolfe et al. (2016) conducted a review of intervention studies, between the years of 2000 and 2013, to examine the empirical support for CICO as an evidence-based practice for attention-maintained behavior and escape-maintained behavior. Their search included studies that implemented CICO with and without adaptations for students with and without disabilities. Sixteen studies met their inclusion criteria. Data from their analysis indicated there was sufficient evidence to support CICO as an evidence-based practice for students with attention-maintained behavior. However, modified CICO was considered a promising practice for students with escape-maintained behavior because there were not enough studies to qualify traditional CICO as an evidence-based practice for students with escape-maintained behavior.

More recently, Drevon and colleagues (2018) conducted a review of literature and meta-analysis between 2002 and 2018 to examine the role of moderating variables in the effectiveness of CICO. Drevon et al. included studies that (a) implemented traditional six-step CICO or modified CICO, (b) compared CICO to a baseline or control condition, (c) examined student outcomes, and (d) included a group experimental or a single-case research design. Of the 37 studies meeting inclusion criteria, the dependent variable for 41% was related to problem behavior and for 20% was related to points on DPR. The researchers conducted an FBA in 68% of studies. Studies took place across elementary, secondary, and alternative settings. Data from effect size calculations indicated that CICO improved student outcomes by one standard deviation on average. Drevon and colleagues also conducted a moderator analysis and found grade level, setting, and function were not moderators for the effectiveness of CICO. According

to the researchers, the reason why function was not a moderator could be because some of the studies made adaptations to standard CICO based on function. Finally, data suggested that relationship to mentor was a possible moderator.

In summary, the literature reviews on CICO provide support for its effectiveness. Overall, CICO is an effective intervention to address the attention-maintained (Wolfe et al., 2016) and escape-maintained (Drevon et al., 2018) behaviors. Furthermore, CICO has sufficient evidence to be deemed an evidence-based practice (Maggin et al., 2015; Wolfe et al., 2016).

Adaptations to CICO

Although CICO has been identified as an evidence-based practice (Maggin et al., 2015), it is not always effective in reducing the challenging behavior of all students. In order to improve the effectiveness of CICO for some students, the implementers may need to adapt procedures and/or the DPR (Majeika et al., 2020). The National Center for Leadership in Intensive Intervention published a guide for intensifying CICO for students with emotional or behavioral disabilities (Kunemond et al., 2017). Kunemond and colleagues (2017) also indicated adaptations may be especially necessary for students whose behavior is maintained by reinforcers other than peer or adult attention (e.g., escape). According to Kunemond et al., CICO can be adapted by (a) increasing dosage, (b) modifications to standard components (e.g., DPR, check-in, parent communication, reinforcers), or (c) adding additional interventions. Even though these adaptations were specifically designed for students with emotional or behavioral disabilities, modifications may be beneficial for any student for whom the standard six-step CICO is ineffective.

Processes for Making Adaptations

Several research teams have suggested processes for making adaptations to CICO. Bundock and colleagues (2019) outlined a step-by-step process for considering adaptations to the standard CICO protocol. First, SWPBIS teams should outline a referral and identification process for CICO. This will ensure students who need CICO are referred and receive intervention efficiently. Second, after a student is referred, the team should identify target behavior and operationally define expectations. This will allow teams to take data on the effectiveness of CICO as it directly relates to the behaviors of concern. Additionally, operationally defining the behaviors and expectations may allow teams to better understand adaptations that may be effective. Third, the team will review existing data to determine if additional supports are necessary. Sources of existing data may include data used for referral on the specific behavior, academic progress monitoring data, and anecdotal notes from teachers about supports that are currently working for the student. Fourth, the team will determine criteria for monitoring response to CICO. Fifth, the team will determine how to monitor implementation fidelity. Data on the student's response to CICO is only valid if CICO is implemented with fidelity. Finally, the team will implement and monitor adapted CICO implementation.

To further the work of Bundock and colleagues (2019), Commisso et al. (2019) outlined specific considerations based on student characteristics for choosing adaptations. First, the CICO team should consider when to make adaptations to the standard CICO protocol. The team may choose to make adaptations before implementation or when data show the student's behavior is not responsive to standard CICO. Next, the team should consider the student's specific behavioral and social skill support needs. Based on student's support needs, the team may add a mini social skills lesson with examples and nonexamples to check-in or add visuals of expected

behaviors to the DPR based on the student's behavioral needs. Then, the team should consider adaptations related to the function of the student's behavior. If the student displays challenging behavior to obtain adult attention, the team may consider adding an additional check-in or additional adult feedback throughout the day. If the student displays challenging behavior to obtain peer attention, the team may consider using a peer for the check-in and check-out or adding peer attention as reinforcement for meeting the daily point goal (e.g., time to play a game with a peer). If the student displays challenging behavior to escape task demands, the team may consider having the student earn escape from a nonessential academic task as reinforcement for meeting the daily point goal. The team also may consider teaching the student functionally equivalent, prosocial behaviors using systematic instruction. These prosocial behaviors could be listed with the schoolwide expectations. For example, the team may teach a student who displays escape-maintained challenging behavior to use a break card in addition to implementing CICO. Finally, the team should consider other adaptations, such as allowing the student to pick the reinforcer, preference assessments for reinforcers, or adding weekly goals with larger reinforcers.

In addition to the suggested processes for making adaptations to standard CICO protocol, Boden and colleagues (2012) offered specific adaptations for students with ID. Their suggested adaptations were aligned with the typical support needs of students with ID have. First, teams may need to modify the check-in. Because many students with ID require additional support to generalize learning, the team could consider having it occur in the self-contained classroom. Further, students with ID may require additional support to maintain attention and need frequent reminders. Teams should consider limiting the check-in to 5 min multiple times per day. Second, the team will need to consider modifying feedback the student receives throughout the day and on the DPR. Students with ID may require additional support in reading, working memory, and

abstract concepts. The team may add symbols to the DPR and use a yes/no format instead of numbers. Additionally, the teacher may provide immediate feedback for inappropriate behavior, instead of waiting until the end of the period to assign points. Third, the team should consider specific adaptations to the check-out process. Students with ID may need additional support to communicate. The mentor could provide additional written feedback to parents on the DPR to assist the student in communicating about the day with parents. Fourth, the team should consider specific adaptations to the home component. Some students with ID may require more frequent reinforcement. The parent also could provide reinforcement at home for meeting the point goal on the DPR. Finally, the team will need to consider modifications that will help the student return the signed DPR to school in the morning. Additional reinforcement for returning the signed DPR may help students with ID who need additional support with organizational skills.

In reaction to COVID-19, the Center on PBIS (2020) released guidance on adapting CICO for distance learning. Because most schools had some virtual component during the 2020-2021 school year, it was essential to adapt CICO to meet students' needs in this new learning format. The Center on PBIS suggests CICO support should continue during virtual learning, but adaptations should be mindful of the competing responsibilities of the teacher and family. First, teams will need to revise the DPR to meet the virtual schedule. This could include ratings for (a) all distance learning activities (e.g., synchronous instruction and independent work); (b) the full day, including home activities (e.g., chores, eating meals); or (c) just one subject. The DPR may need to be electronic so everyone always has access. Further, the team may need to adjust the point goal, because different people may be rating the student (e.g., family members). Second, the team will need to adjust the check-in and check-out procedures. These can occur via video or phone call. Other school staff who may not interact with the student in virtual environment (e.g.,

custodian, principal, bus driver), but who have a positive relationship with the student, may serve as mentors for the check-in and check-out process. Additionally, the family could be included in the check-in or check-out to continue the school-home communication. Furthermore, rewards should be adapted to meet the family's needs and resources. Finally, family should be included in the training process, as they will most likely have a larger role in implementation.

Effectiveness of Adaptations to CICO

Because adaptations are needed for CICO to be effective for some students, many researchers have adapted components of CICO. Majeika and colleagues (2020) conducted a review of literature to examine adaptations made to CICO. The researchers had two inclusion criteria. First, implementers needed to include all critical components of CICO. Second, the dependent variable needed to target student behavior. Thirty-two studies met their inclusion criteria. Data from their analysis indicted 70% of the studies made adaptations to traditional CICO. Most of the time (74.3%), researchers made adaptations at the onset of the intervention. Only 9.9% of studies made adaptations after data indicated the student was not responding to traditional CICO. Researchers made adaptations to check-in for 86.8% of participants, to check-out for 45.3% of participants, to the DPR for 45.3% of participants, and to the home component for 30.2% of participants. Data also suggest that researchers added a component for 14.2% of participants. Most adaptations were made based on FBA data, standardized assessment, observational data, and clinical judgement; whereas, one third of adaptations were made without data. The most common adaptations were the use of a peer mentor, individualized expectations, adaptations to parent communication, and additional check-ins.

Overall, researchers from CICO studies have reported adaptations to the DPR, reinforcers, and CICO procedures. The adaptations have shown effectiveness in supporting students' behaviors, as described below.

Adaptations to Procedure. One way researchers have adapted traditional six-step CICO is by modifying the procedure. Modifications have included additional check-ins (Sobalvarro et al., 2006), changes to the home component (Swoszowski et al., 2012), and function-based reinforcement (Campbell & Anderson, 2008).

First, Campbell and Anderson (2008) adapted the CICO procedure after a student's challenging behavior did not reduce as a result of the traditional six-step CICO implementation. Campbell and Anderson used a single-case reversal design to determine the effectiveness of traditional and adapted CICO on the challenging behavior of two 10-year-old male elementary school students. Neither participant received special education services. During intervention, school staff implemented CICO using the standard protocol with both students. Because there was minimal change in challenging behavior for both participants with standard CICO, the researchers adapted CICO with function-based reinforcers. Both participants displayed challenging behavior to obtain peer attention. The researchers adapted CICO so participants could earn peer attention meeting 50% of their point goal in the morning and again for meeting the total point goal at the end of the day. Data indicated there was a functional relation between adapted CICO and reduction in challenging behavior for both participants; however, data remained variable for one participant.

In another study, Sobalvarro and colleagues (2016) used a multiple baseline across participants design to evaluate the effectiveness of traditional and modified CICO within a SWPBIS framework on the off-task behaviors of two kindergarten students in an urban

elementary school. Neither participant received special education services. During baseline, students received Tier 1 supports (i.e., schoolwide recognition ceremonies and promotion of school rules) only. During intervention, school staff initially implemented the traditional six-step CICO for both students. At the onset of traditional CICO, there was an immediate decrease in the level of off-task behaviors for one participant. For the second participant, there was no change in the level of off-task behaviors and there was an increase in disruptive and nondisruptive off-task behaviors. The team modified CICO for the second participant to include an additional check-in with the mentor at lunch. When modified CICO was implemented with the second participant, there was an immediate decrease in the level of disruptive and nondisruptive off-task behaviors.

Unlike Campbell and Anderson (2008) and Sobalvarro et al. (2016), Swoszowski and colleagues (2012) adapted the procedures at the onset of intervention. Swoszowski et al. used a nonconcurrent multiple baseline across participants design to evaluate the effectiveness of the traditional six-step CICO procedure with an adapted home component on the challenging behaviors of six students with emotional and behavioral disabilities in sixth through ninth grades in a residential facility that implemented SWPBIS. Three students displayed escape-maintained behavior, and three students displayed attention-maintained behavior. During baseline, teachers provided Tier 1 supports (i.e., taught schoolwide expectations and provided schoolwide rewards for displaying behaviors related to expectations) to students. During intervention, school staff implemented CICO following traditional procedures. However, the home component was modified. After school, students returned to their residential housing facility and shared their DPRs with a staff member, instead of parents. Staff members signed the DPR and ensured students returned it to school the next day. Results indicated that CICO was an effective

intervention for two of three students with escape-maintained behavior and two of the three students with attention-maintained behavior.

Adaptations to the DPR. Other research teams made adaptations to the DPR. Karhu and colleagues (2018) used a multiple baseline across participants design to evaluate the effectiveness of adapted CICO on the challenging behavior of two elementary students with attention-deficit hyperactivity disorder within a school implementing a SWPBIS framework in Finland. During baseline, students received Tier 1 supports only (i.e., taught expectations and received frequent feedback). During intervention, school staff implemented traditional six-step CICO with daily report card that included individualized goals. The school team created the individual goals based on data gathered from the Functional Assessment Checklist for Teachers and Staff (FACTS; March et al., 2000) and aligned them to schoolwide expectations. Data indicated a decrease in challenging behavior for both participants, but data remained variable for one student.

Adaptations to Procedure and DPR. In addition to modifying either the CICO procedures or the DPR, it may be necessary to adapt both in some cases. For example, Boden and colleagues (2018) made adaptations to CICO prior to the start of intervention to both the procedure and DPR based on student characteristics and previous needs. They used a multiple baseline across settings design to determine the effectiveness of adapted CICO on the on- and off-task behaviors of three high school students with moderate ID in a vocational training program. The three participants received vocational training in the classroom, at the school coffee shop, and at a local restaurant. Prior to the onset of intervention, Boden et al. adapted CICO to include a mid-day check-up. Additionally, they adapted the DPR with pictures and a yes/no format. Feedback throughout the day and during check-in and check-out was shorter and

used modified language. Finally, the home component was adapted in that the teacher in the special education classroom replaced the home component. When students finished with vocational training for the day, they returned to the special education teacher and shared their DPRs. There was a functional relation between the adapted CICO and reduction in participants' challenging behavior. However, CICO was not conducted within a SWPBIS framework.

In summary, most researchers made adaptations to the traditional six-step CICO process to address students' behavioral needs (Majeika et al., 2020). Researchers made adaptations to the procedures (Boden et al., 2018; Campbell & Anderson, 2008; Sobalvarro et al., 2006; Swoszowski et al., 2012), DPR (Boden et al., 2018; Karhu et al., 2018), and goals (Karhu et al., 2018) to increase effectiveness of CICO. Adaptations may be necessary for some students, particularly those with ESN and ASD, to fully benefit from CICO. It is often advantageous for schools and students to make adjustments to CICO before progressing to Tier 3 supports, because Tier 3 supports are time and resource intensive and adaptations to Tier 2 require minimal additional time and resources (Majeika et al., 2020; Rodriguez et al., 2015). To date, there is limited evidence of the effectiveness of traditional or adapted CICO on the appropriate and challenging behavior of students with ASD who have ESN (Boden et al., 2018).

Summary

CICO is an evidence-based practice to address challenging behaviors (Maggin et al., 2015). The traditional six-step CICO process includes: (a) student checks-in with mentor, (b) student gives DPR to teacher, (c) teacher provides feedback to student using DPR throughout the day, (d) student checks-out with mentor, (e) student brings DPR home for parents to review and provide feedback, and (f) student returns signed DPR to school the next day (Crone et al., 2010). CICO is based on contingency contracts (Crone et al., 2010) and has several important

components, including differential reinforcement, punishment, feedback, ongoing data collection, self-management, and parent involvement. For teachers and parents to implement CICO with fidelity, training is essential (Bunch-Crump and Lo, 2017; Karhu et al., 2018; Ruiz et al., 2014; Sobalvaro et al., 2105). With training, teachers can efficiently and effectively implement CICO (Conely et al., 2019; Crone et al., 2010; Rodriguez et al., 2015). Despite the effectiveness of traditional CICO, adaptations to the procedure and/or DPR are sometimes necessary for students to benefit from CICO (Majeika et al., 2020). Adaptations before intervention (i.e., based on student characteristics or previous data) and during intervention (i.e., based on data collected during CICO) may increase the effectiveness of CICO for some students (Boden et al., 2018; Campbell & Anderson, 2008; Karhu et al., 2018; Majeika et al., 2020; Sobalvarro et al., 2015; Swoszowski et al., 2016); yet studies remain limited that included students with ASD who have ESN in either traditional or adapted CICO implementation.

Summary of the Review of Literature

Students with ESN are a heterogenous group who make up the 1-2% of students with the most pervasive and intensive support needs (Taub et al., 2017). Students with ASD are one subgroup of students with ESN. Students with ASD who have ESN are more likely to engage in challenging behavior than students with ASD who do not have ESN and peers without disabilities (Jang et al., 2011; Matson et al., 2010). As a result, students with ASD who have ESN can have pervasive behavioral and social support needs (Shogren et al., 2017). Although researchers identified 26 evidence-based practices to address challenging behavior of students with ASD (Steinbrenner et al., 2020), teachers do not consistently implement these practices (Brock et al., 2020; Hess et al., 2008). This could be because teachers often lack the training and

resources to implement evidence-based practices (Brock et al., 2014; Morrier et al., 2011) and BIPs (Robertson et al., 2020).

SWPBIS offers a potential solution to these challenges. SWPBIS is a multitiered framework to support the behavioral and social needs of every student, including those with disabilities (George et al., 2009; Horner & Sugai, 2015; Lewis et al., 2016; Mitchell et al., 2018; PBIS, 2019; Sugai & Horner, 2006, 2009). With a coordinated effort by all staff, SWPBIS is a sustainable framework (McIntosh et al., 2009) that prioritizes behavioral needs of all students with data-based decision making, evidence-based behavioral practices across the tiers, and systems to support implementation (Horner & Sugai, 2015; Lewis et al., 2016; Sugai & Horner, 2006, 2009). SWPBIS can have a positive impact on student behavior (Bradshaw et al., 2010, 2012; Gage et al., 2019; Kim et al., 2018; Wassdrop et al., 2012), teacher wellbeing (Kelm & McIntosh, 2012; Ross et al., 2012), and school climate (Bradshaw et al., 2009; Horner et al., 2009; Simonsen et al., 2010), and it has a strong evidence base (Horner et al., 2010; Mitchell et al., 2018). However, students with ESN are not always included in SWPBIS implementation (Kurth & Enyart, 2016; Kurth & Zagona, 2018; Walker et al., 2018). This could be because SWPBIS leaders do not always consider students with ESN when planning for implementation (Landers et al., 2012; Walker et al., 2018) due to low expectations for students with ESN and the perception of characteristics of students with ESN as barriers (Walker et al., 2018; Walker et al., 2020). Furthermore, students with ESN are often physically separated from peers in self-contained classrooms and considered programmatically separate by school leaders (Kurth & Zagona, 2018). Despite these perceived barriers, some schools are attempting to include students with ESN in SWPBIS (Walker et al., 2020), and the very limited research suggests students with ESN may benefit from inclusion in SWPBIS (Loman et al., 2018).

Because students with ASD who have ESN have increased behavioral and social support needs (Shogren et al., 2017), it is possible that they will need Tier 2 support in addition to Tier 1. CICO is an evidence-based and commonly implemented Tier 2 behavioral intervention (Conley et al., 2018; Maggin et al., 2015) based on a contingency contract (Crone et al., 2010). CICO includes six steps: (a) student checks-in with mentor, (b) student gives DPR to teacher, (c) teacher provides feedback to student using DPR throughout the day, (d) student checks-out with mentor, (e) student brings DPR home for parents to review and provide feedback, and (f) student returns signed DPR to school the next day (Crone et al., 2010). With training, CICO is efficient and easy for school staff to implement with fidelity (Conley et al., 2019; Crone et al., 2010; Rodriguez et al., 2015). CICO is effective at decreasing challenging behavior and increasing appropriate behaviors for students with various topographies and functions of challenging behavior across diverse settings (Drevon et al., 2018; Ennis et al., 2012; Hawken et al., 2007, 2011; Maggin et al., 2015; Miller et al., 2015a; Simonsen et al., 2011; Wolfe et al., 2016). Furthermore, CICO is often adapted to meet the needs of individual students (Majeika et al., 2020). Although CICO is an evidence-based practice, none of the studies used to classify CICO as an evidence-based practices included students with ASD who had ESN (Maggin et al., 2015). Research investigating the effects of CICO (traditional or adapted) with students with ASD who have ESN is important.

CHAPTER 3: METHOD

This study involved the use of a single-case multiple baseline across participants with an embedded multiple treatments design (Baer et al., 1968; Cooper et al., 2020; Ledford & Gast, 2018) to investigate the effects of traditional six-step and adapted CICO on (a) the adherence to schoolwide expectations and (b) challenging behavior of students with ASD who have ESN. This chapter includes a description of the methodology used in this study in the following sections: institutional review board, consent process and participants, setting, materials, researcher and interventionists, experimental design, dependent variables, interobserver agreement and procedural fidelity, social validity, procedures, and data analysis.

Institutional Review Board

Prior to recruitment, I, as the researcher of this dissertation, submitted a study protocol to the University of North Carolina at Charlotte's Institutional Review Board (IRB) to ensure proper protections were in place for all participants. After obtaining approval from the IRB, I contacted teachers who support students with ESN in self-contained classrooms for students with ASD in a suburban elementary school implementing SWPBIS to begin recruitment.

Consent Process and Participants

Consent Process

I obtained parental consent for student participants and secured informed consent from school staff participants and parent participants prior to any data collection. First, I emailed teachers who support students with ESN to set up a time to meet via Zoom or Microsoft Teams. During the meeting, I explained the participant inclusion criteria to the teacher. Teachers nominated students who met the following inclusion criteria: (a) had an educational eligibility of autism; (b) qualified, or anticipated qualification, for alternative assessment; (c) displayed

challenging behavior at least three times per day that was not physically dangerous to themselves or others; and (d) had attendance of at least 90% in the previous school year. Students were excluded for (a) attendance less than 90%, (b) displaying physically aggressive or dangerous behaviors more than once per week, and/or (c) having a behavior support plan as part of their individualized education program (IEP) for aggressive or dangerous behavior. Once nominated by the teacher, I sent an email introducing the project to parents (see Appendix A). The teacher forwarded the email to parents. The email consisted of a description of the project, my contact information, and directions to reply to the email if the parent was interested in having their child participate. The teacher resent my email as a follow up 1 week and 2 weeks after the initial email. Once parents replied to the teacher, I directly emailed the parent to let them know a consent packet would be delivered to them in a separate email via DocuSign. The consent packet included a parental consent form for participation in the study (see Appendix B) and a video consent form (see Appendix C) with contact information for parents to reach me and the responsible faculty with any questions. Parents signed the consent via DocuSign. If parent did not return the consent form within 2 weeks, I sent a second consent packet via email. Because the teachers reported that none of the students had a reliable yes/no response, I assumed assent unless behaviors would increase by 50% or more at any point in the study. If challenging behavior increased by 50% or more for three consecutive data points, student consent would have been considered withdrawn. This did not occur for any student. I recruited a total of four student participants.

After obtaining parental consent and student consent, I emailed all teachers and paraprofessionals (see Appendix D) who supported student participants to set up a time to meet. I scheduled a Zoom or Microsoft Teams call with teachers and paraprofessionals who supported

the student participants throughout the day. I explained the purpose of the study and role of their participation to teachers and paraprofessionals using a script (see Appendix E). Prior to the meeting, I emailed the consent form (see Appendix F) and video consent form (see Appendix G) via DocuSign. The teachers and paraprofessionals had an opportunity to ask questions and read the consent form and the video consent form. All special education teachers and paraprofessionals who supported the student participants elected to participate and signed the consent form and video consent via DocuSign. The lead classroom teachers nominated two additional school staff members to participate as mentors for the student participants. I then sent an email to potential school staff to invite them to serve as a mentor for student participants (see Appendix H). In order to serve as a mentor, the individual had to be employed by the school district and work at least part time for the school. I scheduled a video call with each potential mentor to explain the purpose of the study and the role of their participation in the study using the recruitment script (see Appendix I). After the meeting, I emailed the consent form (see Appendix J) and video consent form (see Appendix G) via DocuSign. The mentor had an opportunity to ask questions and read the consent form and the video consent form. The mentor signed the consent form and video consent form via DocuSign. Two front office staff members agreed to serve as mentors. Only school staff (i.e., teachers, paraprofessionals, mentors) who signed both consent forms were included in the study.

In addition to the parental consent for the student participants, I also emailed the parents with an explanation of their own participation in the study (i.e., to receive parent training and to participate in the home component of the CICO), consent to participate in research (Appendix K), and a video consent form (Appendix G) via DocuSign. To participate in the study, the adult had to be the legal guardian of the student participant. Three of the four students' parents (i.e.,

Lewis's father, John's mother, and Alex's mother) chose to participate. Parents signed the consent form and video consent form via DocuSign. Parent participation was not required for student participation.

Because all research supports and observations were conducted virtually due to COVID-19, signed consent for participation in the research study and signed video consent were required for all participants (i.e., students, school staff, and parents). All data collection took place via video calls (e.g., Zoom or Microsoft Teams) or video recordings, thus necessitating video consent for all participants.

Participants

Student Participants. Four elementary students participated in the study. Lewis was an 8-year-old Black male with ASD and a learning disability. He was in the second grade and was primarily served in a classroom for students with ASD in kindergarten through second grade. According to the most recent adaptive behavior scores on the Developmental Profile-4th Edition (DP-4; Alpern, 2020), the parent ratings for adaptive behavior were in the delayed range (i.e., less than 0.1 percentile) and the teacher ratings for adaptive behavior were in the below average range (i.e., 8th percentile). Recent intelligence quotient (IQ) testing was unavailable. He communicated primarily using multiword vocalizations to express his wants and needs, comment, and ask questions. His vocal speech was intelligible to all listeners. He could follow multistep directions, but he often needed prompting to redirect his attention to the requested task. He typically engaged in parallel play with same age peers. His special education teacher anticipated he would participate in the state's alternate assessment the next year. Lewis's challenging behaviors included off-task behaviors (i.e., refusal to start work, stopping in the middle of a task, off-topic comments, leaving his seat).

John was an 11-year-old White male with ASD. He was in the fifth grade and was primarily served in a classroom for students with ASD in third through fifth grades. According to the most recent adaptive behavior scores on the Adaptive Behavior Assessment Systems, Third Edition (ABAS-3; Harrison & Oakland, 2015), John's general adaptive composite score was extremely low (i.e., less than 0.1 percentile). According to the most recent IQ testing, the Leiter International Performance Scale, Third Edition (Leiter-3; Roid et al., 2013), his IQ was 58, which is at the 0.3 percentile. He communicated primarily using speech with one- to three-word phrases to comment, respond to questions, request, and ask questions. His speech was reported as 50-70% intelligible. He used pictures with prompting to support his speech. John could follow familiar and novel directives. He qualified for the state's alternate assessment. John's challenging behavior included off-task behaviors (i.e., leaving the instructional area, and laughing, screaming, crying, and singing unrelated to the lesson), physical aggression (i.e., spitting, hitting, throwing objects), and self-injury (i.e., running into walls, hitting his head, dropping to the ground). At the onset of the study, his physically aggressive behaviors and self-injurious behaviors occurred less than once a week, and I did not observe aggressive behaviors during the FBA. Therefore, he met eligibility requirements for this study.

Alex was an 11-year-old White male with ASD who attended the same classroom as John. Alex was in the fifth grade. Recent IQ and adaptive behavior scores were unavailable. He communicated using one- to three-word spontaneous spoken phrases supported by picture symbols for requesting independently or commenting with prompting. He was beginning to interact with peers and would initiate interactions with adults if he needed something. He qualified for the state's alternate assessment. His challenging behavior included physical aggression (i.e., hitting or attempting to hit parents and educators) and off-task behaviors (i.e.,

leaving his seat, walking away from the instructional area, playing with items in front of his face). At the onset of the study, Alex's attempts to hit were not forceful, and the teacher did not feel they would result in harm to himself or others. Additionally, the trained observer did not observe these behaviors more than once a week during observations for the FBA. Therefore, he met eligibility requirements.

Connor was an 8-year-old White male with ASD who attended the same classroom as Lewis. He was in the second grade. According to the most recent adaptive behavior scores on the ABAS-3 (Harrison & Oakland, 2015), Connor's general adaptive composite score was below average (i.e., 14th percentile) with delays in functional academics, communication, health and safety, and leisure skills. Recent IQ testing was unavailable. He communicated vocally primarily using one- and two-word phrases. With prompting, he could communicate his needs and wants using complete sentences. Connor would interact and play chase games on the playground with peers with prompting. His special education teacher anticipated he would participate in the state's alternate assessment the next year. Connor's challenging behavior included work refusal (i.e., saying "no," "I can't", or "go home"; off-topic vocalizations; pushing away materials or teachers; refusal to start work; stopping before completing a task).

Educator Participants. Eight educators participated in the study, including two special education teachers, four paraprofessionals, and two front office staff members. The first special education teacher was a 40-year-old Hispanic female with 5 years of experience in her current role supporting students with ASD. She was the primary special education teacher for Lewis and Connor. She was a licensed special education teacher with a bachelor's degree. She had previous experience supporting students with intellectual disability, ASD, multiple disabilities, and developmental delay. She had prior training experience in function-based interventions and

PBIS. In addition to the special education teacher, two paraprofessionals also supported Lewis and Connor in their classroom. The first paraprofessional was a 56-year-old Black female with 1.5 years in her current role. She had a bachelor's degree and certification as an early childhood associate. She had experience supporting students with intellectual disability, ASD, multiple disabilities, and developmental delay, and had previous training in PBIS, functional behavior assessments, and ASD. The second paraprofessional was a 59-year-old Black female with 5 years of experience supporting students with disabilities and 14 years supporting elementary-aged students. She had an associate degree in teaching. She had previous experience supporting students with intellectual disability, ASD, multiple disabilities, and developmental delay.

The second special education teacher was a 42-year-old White female with 7 years of experience in her current role supporting students with ASD. She was the primary special education teacher for John and Alex. She was a licensed special education teacher with a bachelor's degree and graduate work in special education. She had previous experience working with students with intellectual disability, hearing impairment, speech impairment, visual impairment, emotional disturbance, orthopedic impairment, ASD, deaf blindness, multiple disabilities, developmental delay, and traumatic brain injury. She had previously received training in PBIS and applied behavior analysis (ABA). Two additional paraprofessionals also supported John and Alex. The first paraprofessional was a 47-year-old White female with 5 years of experience. She had an associate degree and prior experience supporting students with intellectual disability, hearing impairment, speech and language impairment, visual impairment, emotional disturbance, orthopedic impairment, other health impairment, ASD, specific learning disability, deaf blindness, multiple disabilities, developmental delay, and traumatic brain injury. The second paraprofessional was a 46-year-old White female with 16 years of experience. She

had a bachelor's degree and previous experience supporting students with intellectual disability, emotional disturbance, ASD, and developmental delay.

Two front office staff members served as mentors. The first front office staff was a 39-year-old female with 1 year of experience in her current role and had an associate's degree. She served as the primary mentor for Lewis, John, and Connor. The second front office staff member was a 38-year-old female with 2 years of experience in her current role and had a bachelor's degree. She served as the primary mentor for Alex.

Parent Participants. All parents of student participants were invited to participate in the study. Lewis's father, John's mother, and Alex's mother chose to participate. All parents attended the training.

Setting

The study took place at an elementary school and in the elementary school's virtual learning environment. The elementary school was located in a suburban county in a southeastern region of the United States. The school was recognized by the state for implementing SWPBIS with fidelity. Approximately 53% of the students were White, 29% were Hispanic, and 14% were Black. The school was a Title 1 school where about half of the students qualified for free or reduced lunch. Data on the percentage of students with disabilities was unavailable. The study primarily took place in two self-contained classrooms for students with ASD. The first classroom included seven students with ASD (including Alex and John), ages 8-11. The students received supports from one special education teacher and two paraprofessionals. The second classroom included five students with ASD (including Lewis and Connor), one with intellectual disability, one with multiple disabilities, and one with a developmental delay. All students were 6 to 8 years old. The students in the second classroom received supports from one special education teacher

and two paraprofessionals. Due to COVID-19, some of the instruction and intervention sessions occurred during virtual, synchronous instruction. When receiving in-person instruction, students attended school Monday through Thursday and received all services as described in their IEPs. When the district required all students to engage in virtual learning, Monday through Thursday, students logged into a class meeting through Microsoft Teams, and the teacher provided live, virtual instruction. Fridays were reserved for asynchronous virtual learning during in-person instruction and virtual learning. The check-in, feedback, and check-out occurred in vivo for in-person instruction and via video call (i.e., Microsoft Teams) during virtual learning. The final step of CICO, parent feedback and signature, took place at each student participant's respective home regardless of in-person or virtual instruction.

Materials

There were several materials for the study. These included Daily Progress Reports, implementation scripts, functional behavior assessment forms, behavior observation forms, and technology.

Daily Progress Report

Each student's Daily Progress Report (DPR) served as the primary data collection tool. During in-person instruction, the DPR was printed daily for each student. Virtual CICO implementation involved a virtual copy (i.e., on Google Drive) for Lewis and two printed copies for Alex. For Alex's virtual CICO implementation, the teacher marked one DPR and showed it on camera, and the parent marked the other copy. The traditional DPR contained a chart (see Appendix L). On the chart, there was a list of schoolwide expectations (i.e., respectful, responsible, safe) and a space for teachers to mark points for each interval or subject area to reflect the student's adherence to each expectation for the designated interval. Students could

earn zero, one, or two points for each expectation. Students earned two points if they completely met the expectation, one point if they partially met the expectation, or zero point if they did not meet the expectation. This point card was consistent with the point cards described in previous CICO research. If students did not respond to traditional CICO, the DPR was adapted (see Appendix M) to incorporate evidence-based practices for students with ASD (e.g., visual supports, augmentative and alternative communication). For example, John's DPR was adapted with picture supports of the operational definitions of target appropriate behaviors related to each expectation and green smiley faces instead of numbers. Each student participant received a new printed or digital DPR daily during intervention.

Implementation Scripts

To support CICO implementation, mentors, teachers and paraprofessionals, and parents received scripts (see Appendices N, O, and P, respectively). All scripts included multiple versions based on the points earned by the student for following the schoolwide expectations. The mentor script included two versions: if the student met their point goal and if the student did not meet their point goal. The teacher script included three versions: if the student earned mostly 0, if the student earned mostly 1, and if the student earned mostly 2. The parent script included two versions: if the student met their point goal and if the student did not meet their point goal. Parents received their scripts in an email. During in-person learning, parents reviewed the point card at home with their child, signed the point card, and returned it the next day in the child's backpack. During virtual learning, based on recommendations from the Center on PBIS (2020), parents attended the check-out session at least once a week and used the script to provide feedback to their child.

Functional Behavior Assessment Forms

To obtain information about each student participant's behavior, I conducted a functional behavior assessment (FBA) by using (a) Functional Assessment Checklist for Teachers and Staff (FACTS; March et al., 2000) and (b) Functional Assessment Observation (FAO) form (O'Neill et al., 2015). I met virtually with the lead classroom teacher to complete the FACTS. The FACTS is a functional assessment interview tool designed to efficiently gather information about possible antecedents and consequences related to an individual's targeted challenging behavior (March et al., 2000). The FACTS consisted of two parts: Part A and Part B. Part A included questions about the category of challenging behavior and when, where, and with whom the behaviors are most likely to occur. The last question in Part A asked the interviewee to choose one to three routines to focus on in Part B. Part B consisted of questions about the routine, topography of challenging behavior, and current consequences for challenging behavior. The last questions on Part B prompted the interviewee and interviewer to create a summary statement of the behavior and possible maintaining consequences and related antecedents. The FACTS is more time efficient when compared to longer functional assessment interview forms (March et al., 2000). After completing the FACTS with the teacher, the trained observer or I observed the student during in person (Lewis, John, and Connor) or virtual (Alex) instruction using the FAO form (O'Neill et al., 2015) to gather additional information regarding the function of the challenging behavior. The FAO is a direct observation tool that allows the observer to efficiently gather information about the observed antecedents and consequences related to the target challenging behavior (O'Neill et al., 2015). The trained observer or I observed each student for 2-3 sessions virtually through a Zoom meeting or Microsoft Teams meeting with the teacher or a recorded video of the session the teacher uploaded to Dropbox. Each session lasted 14 min to 31

min. The trained observer or I recorded a minimum of 15 behavioral events for each student. Additionally, for every event of challenging behavior, the observer and I noted observed antecedents, observed consequences, and the possible maintaining consequence. An FBA was used to inform decisions about adaptations to the traditional six-step CICO procedure.

Behavioral Observation Form

In addition to the FBA forms, the trained observers and I used a 10 s partial-interval recording data sheet (see Appendix Q) to collect student behavior data during the identified target routine (i.e., the routine where challenging behavior was most prevalent according to the teacher). Because using partial-interval recording can result in an overestimate of the occurrence of challenging behavior, it is best to use when looking for patterns of data related to decreases in challenging behavior (Cooper et al., 2020). The trained observer and I conducted observations virtually through a Zoom or Microsoft Teams meeting with the teacher or the teacher recorded the session and upload it to Dropbox. The trained observer or I marked the behavior as occurring if targeted challenging behavior occurred at any point during an interval, and marked the behavior as not occurring if the student did not engage in the challenging behavior for any part of the interval. Observations using the 10 s partial-interval recording data sheet occurred during baseline and intervention conditions.

Technology

Because of restrictions due to COVID-19, technology was integral to this study. All observations and trainings occurred via voice or video call (i.e., Zoom or Microsoft Teams) or via video recording. For the training and procedural fidelity checks, the trained observers and I used a personal laptop with Wi-Fi functionality and a camera. The school staff used personal or school provided laptops with Wi-Fi functionality and a camera, phones, or the provided

recording device (i.e., iPad, GoPro, video camera). Parents used a personal device (e.g., tablet, computer, phone) with Wi-Fi functionality. During virtual instruction, students used district provided or personal devices (e.g., tablet, computer) that had Wi-Fi functionality. During virtual instruction, students received synchronous, online instruction from their primary classroom teacher. The students logged into the session from their district provided or personal device. On virtual learning days, the check-in, check-out, and feedback occurred virtually. An observer or I attended the virtual sessions via Microsoft Teams at least twice a week for check-in, check-out, and feedback. During in-person instruction, an observer or I virtually attended the feedback sessions via Zoom or Microsoft Teams. During in-person instruction, the teacher recorded the check-in and check-out twice a week and upload them to Dropbox. Observers viewed the videos as needed for data collection.

Researcher, Interventionists, and Secondary Observers

I was the primary researcher for this study. As a doctoral candidate in special education, I had 6 years of experience as a special education teacher supporting students with ESN. I earned a Bachelor of Science degree in Special Education, a Master of Education degree in Special Education, and a Graduate Certificate in ASD. For this study, my primary responsibilities were obtaining IRB approval and school approval, obtaining consent from all participants, providing training on CICO, completing an FBA for each student participant, and collecting data on challenging behavior and on procedural fidelity as primary data collector for Lewis, John, and Connor.

The primary interventionists for this study were the school staff. The mentors implemented the morning check-in and the afternoon check-out. The teachers and paraprofessionals marked points on the DPR and provide feedback at designated intervals

throughout the day. The parent of each student served as an additional interventionist. The parents reviewed the DPR with their child and signed the DPR. On synchronous virtual learning days, parents also provided reinforcement if the student met the point goal and attended check-out.

There were two secondary observers. The first secondary observer was a first-year doctoral student in special education. She had prior experience supporting students with ASD and ESN as a classroom teacher. I trained the observer to collect procedural fidelity data on all training sessions and behavioral observations using the partial interval recording method. Her primary responsibilities included collecting data on Alex's challenging behavior and on any associated procedural fidelity measure for Alex, as well as collecting procedural fidelity data for all training sessions. Another secondary observer was a second-year doctoral student in special education. She had prior experience supporting students with ASD and ESN as a classroom teacher and using partial interval recording. I trained the observer to collect interobserver agreement data on the student participants' challenging behavior using 10 s partial interval recording.

Dependent Variables and Measurement

There were three dependent variables. The primary dependent variable was adherence to schoolwide expectations, measured by the percentage of points each participant earned on their DPR for the day. Teachers and paraprofessionals were responsible for marking points at designated intervals. Students could earn zero, one, or two points for each expectation at the end of each routine, for a total of 6 possible points per routine. Because points can be subjective, I met with teachers and paraprofessionals to establish common guidelines to follow for assigning points for each expectation in a training session before starting the baseline condition. Guidelines

aligned to the school's expectations. At the end of the day, the mentor or teacher calculated the percentage of points each day by dividing the number of points earned by the number of points possible and multiplying by 100. A student had to be present for at least 50% of the intervals each day and complete check-in and check-out sessions with the mentor (during CICO conditions) for data to be recorded. Data on adherence to schoolwide expectations were reported as percentages of possible points earned and graphed to allow for visual analysis.

The second dependent variable was students' challenging behavior. Challenging behavior was operationally defined for each participant. For Lewis, the targeted challenging behavior consisted of off-task behavior (i.e., repeatedly redoing work and making off-task comments or vocalizations) and work refusal (i.e., refusing to start work for more than 4 s after a directive and stopping work for more than 8 s). For John, the targeted challenging behavior consisted of off-task behaviors (i.e., laughing, crying, or screaming for more than 2 s; off-task singing; inappropriate smelling; leaving the camera view; tipping in his chair), aggressive behaviors (i.e., spitting, attempting to hit, throwing objects), and self-injurious behaviors (i.e., running into walls, dropping to the ground, hand or object making contact with his head). Alex's targeted challenging behavior included off-task behaviors (i.e., playing with items in front of his face, leaving or attempting to leave the work area) and aggressive behaviors (i.e., hitting or attempting to hit or push his parent, teacher, or paraprofessional). Connor's targeted challenging behavior included work refusal (i.e., saying "no," "I can't", or "go home"; off-topic vocalizations; pushing away materials or teachers; refusal to start work after 3 directives; stopping for more than 4 s) Direct observation sessions of each student's behavior occurred during an activity the teacher identified as most likely for the student to engage in challenging behavior (i.e., target routine). The target routine was independent work for Lewis and Connor, and writing for John and Alex.

The observers and I used 10 s partial interval recording and marked the behavior as occurring (if targeted challenging behavior occurred at any point during an interval) or not occurring (if the student did not engage in the challenging behavior for any part of the interval) for each 10-s interval. Duration of the target routine/activity lasted between 2 and 33 min for each student. Data on challenging behavior were reported as percentages of intervals and graphed to allow for visual analysis. The observers and I calculated the percentage of intervals of challenging behavior by dividing the number of intervals where challenging behavior occurred by the total number of intervals for the session and multiplying the quotient by 100.

The third dependent variable was adherence to schoolwide expectations during the target routine, measured by the percentage of points each participant earned on their DPR for the day for their targeted activity. Target routines were the same activity for which challenging behavior data were collected. A student could earn a total of six points for the target routine (i.e., two points for being respectful, two points for being responsible, two points for being safe). Data on adherence to schoolwide expectations during the target routine were reported as percentages of possible points earned and graphed to allow for visual analysis. The observer and I calculated the percentage of points earned for the target routine by dividing the total points earned for the routine by the possible number of points for the routine (i.e., six) and multiplying the quotient by 100.

Experimental Design

I used a single-case multiple baseline across participants with an embedded multiple treatments design (Baer et al., 1968; Cooper et al., 2020; Ledford & Gast, 2018) to determine the differential effects of traditional six-step CICO and adapted CICO. Single-case research is an established research methodology based in applied behavior analysis that is used to “examine

casual, or functional, relations by examining the effects of introducing or manipulating an independent variable (e.g., an intervention)" (Horner et al., 2005, p. 172). Single-case research allows researchers to consider the individual participant as the unit of analysis. By design, single-case research controls for most threats to internal validity and allows researchers to analyze the effects of an intervention on the individual (Horner et al., 2005). This is especially important when working with students with low incidence disabilities (e.g., ASD, ESN), because a mean score or statistical analysis may not be valuable (Horner et al., 2005). Single-case research allows researchers to examine responders and nonresponders in detail (Horner et al., 2005).

The design of this study adhered to the What Works Clearinghouse (WWC) design standards (Maggin et al., 2013). First, in order to meet the WWC design standards, the independent variable must be manipulated systematically. In this study, the independent variables were the traditional six-step and adapted CICO. CICO was systematically manipulated across participants using the multiple baseline design. All students began with the baseline condition (i.e., Tier 1 support only; condition A). Then, students entered the first intervention condition (i.e., traditional six-step CICO; condition B) in a staggered fashion. If students responded to traditional six-step CICO, there was a reversal to baseline (i.e., condition A) before reintroducing the intervention (i.e., condition B). If a student did not respond to traditional CICO, they received adapted CICO (i.e., condition C). Following adapted CICO, there was a return to traditional CICO (i.e., condition B) for any student who showed desirable behavior changes during adapted CICO (i.e., condition C).

Second, to meet the WWC design standards each outcome variable should be measured systematically over time by more than one assessor with IOA greater than 80%. In this study, all three dependent variables were measured repeatedly (i.e., 3-4 days per week) for each participant

throughout the study. IOA data were collected for a minimum of 30% of all sessions across all phases. If IOA dropped below 85% at any time, the primary coder met with the secondary observer to review the recording. Third, there must be at least three attempts to demonstrate an intervention effect. In this study, there was an attempt to demonstrate intervention effects across four participants using a multiple baseline across participants design. Additionally, there was an attempt to demonstrate intervention effects within participants for Lewis. Finally, each phase must contain at least three data points. In this study, there were at least three data points per phase in all phases for all participants.

Interobserver Agreement

Interobserver agreement (IOA) data were collected on challenging behavior for at least 30% of all data collection sessions across all conditions. I trained a secondary observer to collect data using 10 s partial interval recording form (see Appendix Q). Using a trial-by-trial method (Cooper et al., 2020), I calculated IOA by dividing the number of intervals with agreement by the total number of intervals and multiplying the quotient by 100.

To ensure correct and consistent assignment of points on the DPR, teachers and paraprofessionals received written guidelines for assigning points, which were agreed upon during the initial training. Because it was not feasible for an observer to attend instruction throughout a student's school day, IOA data for assignment of points on the DPR were collected during the target routine for each student for a minimum of 45% of sessions across conditions. Using the total count IOA method (Cooper et al., 2020), I calculated IOA for the points a student earned by dividing the smaller number of points assigned by the larger number of points assigned and multiplying the quotient by 100.

Procedural Fidelity

I or a trained observer collected procedural fidelity data for 25% of all sessions. Procedural fidelity data were collected on the check-in sessions, check-out sessions, teacher feedback, and parent component.

Check-In and Check-Out Sessions

I gave mentors an implementation self-checklist to utilize daily (see Appendix U). The self-checklist consisted of four steps for check-in and four steps for check-out. I collected procedural fidelity data for at least 25% of all check-in and check-out sessions across CICO phases for all student participants using the same procedural fidelity checklist (see Appendix U). The trained observer or I were present for these sessions via Microsoft Teams or the mentor recorded and uploaded the session for data collection. I calculated procedural fidelity by dividing the number of steps completed by the total number of steps and multiplying the quotient by 100.

Feedback

The teachers and paraprofessionals used an implementation script (see Appendix V) to provide feedback to students on the points earned at the end of every routine. At the end of the day, the teacher uploaded a copy of the point card to Dropbox. The observer confirmed that the school staff provided points throughout the day by checking for number circled at each interval related to each expectation. Procedural fidelity was calculated by dividing the number of intervals circled by the total number of applicable intervals and multiplying the quotient by 100.

Parent Component

I collected procedural fidelity data through review of permanent products and teacher report. During virtual learning, parents were expected to attend at least once a week via phone or

video. During in-person instruction, parents were expected to sign and return the point card daily. During virtual instruction for Lewis, John, and Alex, a secondary observer or I observed all check-out sessions to see if the parent was present. During in-person instruction, a secondary observer or I reviewed the DPRs the teacher collected when the student returned them for John and Alex. Additionally, the teacher reported if the DPR was returned signed or not during in-person instruction for Lewis and Connor.

Social Validity

A measure of social validity is necessary to determine the social significance of the goals, social appropriateness of the procedures, and social importance of the intervention effects (Wolf, 1978). I evaluated the social validity of the study by asking the school staff participants, student participants, and parent participants to complete social validity questionnaires at the conclusion of the study.

School Staff Social Validity Questionnaire

At the end of the study, I emailed school staff a link to a Google form to complete a social validity questionnaire (see Appendix R). The questionnaire consisted of six Likert-type scale questions where school staff participants rated the social validity of the goals, procedures, and outcomes of the intervention on a scale from one (i.e., *not at all*) to four (i.e., *completely*). Additionally, there were four open-ended questions for participants to identify areas that could be changed about the intervention and what was most helpful about the intervention.

Student Social Validity Questionnaire

At the conclusion of the study, I asked teachers to complete an adapted social validity questionnaire with each student participant (see Appendix S) to assess the social validity of the procedures and outcomes of the intervention based on students' perceptions. There were four

questions addressing whether the student enjoyed meeting with their mentor, earning points, and getting feedback from teachers, and whether the student felt CICO helped them follow schoolwide expectations. Adaptations to the social validity questionnaire included two visually supported picture choices for each question.

Parent Social Validity Questionnaire

I emailed parents a link to a Google form to complete a social validity questionnaire (see Appendix T) at the conclusion of the study. The questionnaire consisted of seven Likert-type scale questions for parents to rate the social validity of the goals, procedures, and outcomes of the intervention on a scale from one (i.e., *not at all*) to four (i.e., *completely*) with a focus on feasibility of implementation at home, school-home communication, and degree of social behavioral changes at school and home. Additionally, there were four open-ended questions for parents to identify areas that could be changed about the CICO process and what was most helpful about the process.

Procedures

Prior to baseline, I conducted an FBA for each student participant and provided initial training to teachers and paraprofessionals. There were three experimental conditions, including (a) baseline, (b) traditional six-step CICO, and (c) adapted CICO. Prior to implementation of traditional six-step CICO, I provided CICO training to teachers, paraprofessionals, mentors, and parents.

Functional Behavior Assessment

Once parental consent was received for student participants, I completed an FBA for each student. Although an FBA is not a required component of CICO, researchers in prior studies have suggested its completion to guide adaptations (Boden et al., 2018; Kilgus et al., 2016).

First, I met with the student's lead classroom teacher to complete the FACTS. This was done in an interview format that took no more than 35 min per participant to complete. During this meeting, I asked the teacher to identify the routine during the school day that was most problematic for the student. The teachers identified writing for John and Alex and independent work for Connor and Lewis. Second, I conducted two to three observations to collect additional data related to the function of the student's challenging behavior during the pre-identified routine (i.e., writing for John and Alex and independent work for Connor and Lewis). In order to observe the student's behavior, the teacher recorded the session(s) and uploaded to Dropbox or I observed and recorded the session(s) via a Zoom or Microsoft Teams. I viewed the recording and collect data using the FAO form. I did not conduct a functional analysis to confirm hypothesized function, because prior research warns against delaying access to Tier 2 interventions by conducting a full FBA (Campbell & Anderson, 2008).

Prebaseline

Prior to baseline, I asked each student's lead classroom teacher to confirm the student had access to SWPBIS Tier 1 support (i.e., teaching of schoolwide expectations and reinforcement) by sending a bi-weekly survey. Both classroom teachers confirmed through the survey that the students received at least 2 weeks of Tier 1 support prior to baseline. The survey included three questions (i.e., Were the expectations reviewed, posted, or distributed today? Was your review or display of expectations adapted to meet your students' needs? Did you provide acknowledgement for students following the schoolwide expectations today?; see Appendix Z). I confirmed access to Tier 1 prior to baseline, during baseline, and during intervention through permanent products (e.g., elements in virtual instruction, resources distributed by the school) or direct observation (e.g., teacher reviewing schoolwide expectations). Because CICO is a support

for students who do not respond to Tier 1 alone, it is important students had access to Tier 1 before entering baseline.

Baseline Training

Prior to collecting baseline data, I met with the school staff who gave feedback and points at designated intervals throughout the day via Zoom. Using behavioral skills training (BST; Kirkpatrick et al., 2019), I trained school staff in assigning points on the DPR during a 35-min training with all six teachers and paraprofessionals. BST has been shown to improve teachers' implementation fidelity of a variety of evidence-based practices (Kirkpatrick et al., 2019). First, I provided instructions on what CICO is, the benefits of CICO, and guidelines for assigning points. Second, I modeled how to assign points by reading a case study (see Appendix W) and circling points on a practice DPR. Third, I read another case study or showed a short video clip of the student's session and asked school staff to mark on the DPR. Fourth, I provided performance feedback to school staff. I repeated the third and fourth steps until all school staff participants recorded points with 100% accuracy. The first secondary observer reviewed recordings of the training sessions to ensure the trainings were implemented with fidelity. Baseline training was implemented with 100% fidelity.

Baseline

During baseline sessions, school staff addressed the students' behaviors in accordance with school strategies (e.g., redirecting, reteaching expectations, providing rewards for demonstrating schoolwide expectations). Students received Tier 1 support only. School staff completed the DPR at each designated intervals throughout the day. Student participants did not have access to the DPR or receive feedback or reinforcement. There was a minimum of eight baseline data points across 2 weeks of data collection for each participant. During baseline, I

took observational behavioral data via Zoom or Microsoft Teams or by reviewing pre-recorded videos during the target routine. Additionally, during the observations, I watched for permanent product and teaching related to Tier 1, and I asked teachers and paraprofessionals to complete the three-item short survey about Tier 1 implementation (Appendix Z) once bi-weekly to ensure they continued to implement Tier 1 supports during baseline.

CICO Training

I trained school staff, mentors, and parents to complete their respective portions of CICO. All training for school staff and mentors occurred virtually prior to the first student entering traditional CICO.

School Staff Training. I met with the school staff who gave feedback and points at designated intervals throughout the day via a Zoom or Microsoft Teams. Using BST (Kirkpatrick et al., 2019), I trained school staff to give feedback. First, I reviewed CICO and the procedural fidelity checklist and script (see Appendix V). Second, I modeled how to assign points and give feedback. I read a case study (see Appendix X) and modeled how to give feedback to the student from the case study using the script (see Appendix O) and circle points on a practice DPR. Third, I read another case study or showed a short video clip of a student participant and asked school staff to give feedback and mark the DPR. Fourth, I provided feedback to school staff. I repeated the third and fourth steps until all participants recorded points and gave feedback with 100% accuracy.

Mentor Training. Prior to the first student participant entering intervention, I met with mentors individually via Zoom. Using BST (Kirkpatrick et al., 2019), I trained the mentors to complete the check-in and check-out process. First, I provided instruction on CICO and the procedural fidelity checklist and script for check-in (see Appendix U). Second, I modeled how to

complete the check-in process using a case study. Third, I asked the mentor to practice completing the check-in process for a different case study student. Fourth, I provided feedback. To ensure fidelity, I repeated the third and fourth steps until mentor completed the check-in process with 100% accuracy.

During the same session, I also trained the mentor to complete the check-out process. First, I provided instruction on the importance of the check-out in CICO and the procedural fidelity checklist for check-out with a script (see Appendix U). Second, I showed a completed DPR (see Appendix Y) and demonstrated how to complete the check-out process for the case study student using a script (see Appendix N). Third, I asked the mentors to practice completing the check-out process for a different case study student. Fourth, I provided performance feedback. I repeated the third and fourth steps until the mentor completed the check-out process with 100% accuracy.

Parent Training. I met with parents individually via Zoom or Microsoft Teams. Using BST (Kirkpatrick et al., 2019), I trained the parents to complete the parent component of CICO (i.e., review point card with their child, provide constructive feedback, and sign the DPR). First, I provided instruction on CICO and the importance of the parent component. Second, I modeled how to complete the parent component of CICO with a sample student's DPR (see Appendix Y) and how to give feedback using a script (see Appendix P). Third, I asked the parent to practice reviewing the DPR, giving feedback with the script (see Appendix P), and signing the DPR for another case study DPR. Previous research has demonstrated the effectiveness of BST to improve parents' implementation fidelity of various interventions for children with ESN (Hassan et al., 2018; LaBort et al., 2019). However, research also has shown that parents have difficulty generalizing the skills learned in BST to their child. For this reason, I asked the parents to

practice how they would give feedback to their child if they (a) met the point goal and (b) did not meet the point goal to help parents generalize the skills learned to their child and home setting by following a script (see Appendix P). Fourth, I provided feedback. To ensure fidelity, I repeated the third and fourth steps until the parent completed the parent component of CICO with 100% accuracy or the parent indicated they were comfortable with the process.

Student Training. During the first day of CICO implementation, students met with the mentor for an extra 5 min. First, the mentor provided instruction on CICO and the point card. The mentor explained the six steps of CICO and showed the point card to the student. Second, the mentor explained specific appropriate behaviors with visuals related to the expectations and showed the student how the teacher would mark the point card if they demonstrated or did not demonstrate the appropriate behaviors. Then, the mentor showed the student how points would be marked. Finally, the mentor reminded the student of the expectations for the day, the point goal, and the time and place of the check-in and check-out.

CICO

The CICO intervention took place up to 4 days per week during virtual, synchronous online instruction and in-person instruction for the duration of the school day. All students received the intervention without disruption to their schedules. In addition to conducting observations for permanent products and teaching related to Tier 1, I asked teachers and paraprofessionals to complete the three-item short survey about Tier 1 implementation (Appendix Z) bi-weekly throughout the intervention condition to ensure they continued to implement Tier 1 supports. To mitigate the effects of the changes between virtual and in-person learning, changes in intervention and baseline conditions did not occur the same week as a transition in learning environment. The one exception was for Lewis. Lewis received one day of

the first traditional CICO implementation in school before a sudden transition to virtual instruction. However, traditional CICO implementation was later implemented in person consistently after a return to the baseline condition for Lewis.

Traditional CICO. The traditional CICO involved six steps. First, before virtual or in-person instruction began for the day, the student participant checked in with their mentor via a video call (i.e., Microsoft Teams; for virtual instruction) or in person (during in-person instruction). The mentor showed the student their DPR by sharing their screen or showing them the physical DPR and reviewed the expectations. Then, the mentor asked the student to pick a reward to work for and let the student know the teacher would have the DPR. The student also had access to the digital or physical copy of the DPR. Third, teachers and paraprofessionals provided feedback to the student and marked points on the DPR at designated intervals throughout the day. Fourth, at the end of the day, the student returned the DPR to the mentor to check-out (virtually or in-person). The parent attended the check-out with the student during virtual instruction. A teacher or paraprofessional attended check-out with the student during in-person instruction. During check-out, the mentor reviewed the DPR with the student via video call (i.e., Microsoft Teams) or in person and determined if the student received enough points to meet their point goal. The student received feedback on their behavior performance from the mentor. The mentor provided the reward during in-person instruction, and the parent provided the reward during virtual instruction if the student met the point goal. During in-person instruction, the student took the DPR home and the parent reviewed the DPR with the student, provided feedback, and signed the DPR. During the traditional six-step CICO implementation, Tier 1 support continued. I conducted procedural fidelity data collection (including check-in and check-out sessions, feedback from school staff, and parent component) to ensure traditional six-

step CICO was implemented with fidelity. If it was not (i.e., below 80%), I provided feedback to the implementor and additional training if difficulty with fidelity continued.

Adapted CICO. If a student did not make progress (i.e., no increasing trend or increased level in points, no decreasing trend or decreased level in challenging behavior, or did not meet point goal for at least two of 4 days), I made adaptations using the Adaptations Problem Solving Process (Bundock et al., 2019; see Appendix AA). Data indicated all students needed adaptations. Adaptations included evidence-based practices for students with ASD (e.g., modeling, social narratives, direct instruction, function-based reinforcement, visual supports; Steinbrenner et al., 2020). I met with each student's lead classroom teacher via Zoom or Microsoft Teams to complete the Adaptations Problem Solving Process and conducted individual team meetings for each student participant. First, the team identified target behaviors and operationally defined expectations. This included adding the operational definitions or picture supports to the DPR. Second, the team determined if additional supports, such as an additional check-in or additional reinforcement, were needed. This included adaptations for reinforcement based on the function of the student's challenging behavior. Third, the team considered adapting the point goal. All student participants received adapted CICO for at least three sessions. Alex received a second set of adaptations to CICO after three sessions of the first adaptations that were ineffective. Furthermore, I conducted procedural fidelity data collection to ensure adapted CICO was implemented with fidelity. If it was not (i.e., below 80%), I provided additional training to school staff.

Data Analysis

I analyzed data associated with the three dependent variables using visual analysis. Visual analysis is the most common form of data analysis associated with single-case design

research (Ledford & Gast, 2018). It is used to formatively analyze data to determine changes in intervention and conditions and as a summative assessment to determine a functional relation (Ledford & Gast, 2018). I analyzed data visually within conditions to look for stability in level and trend. I analyzed data visually across conditions to look for changes in level and trend and immediacy of effect. To demonstrate a functional relation, there must be demonstrations of prediction, verification, and replication (Horner et al., 2005). Prediction occurs from a stable baseline which assumes change would not occur unless a new condition was implemented. Verification occurs when other baseline data do not change without intervention. Replication occurs when there are multiple demonstrations that the same intervention has the same effect.

Additionally, statistical calculation can support visual analysis if there are overlapping data between baseline and intervention phases or between intervention phases. I calculated Tau-U, a nonoverlap effect size that can account for trends within phases (Parker et al., 2011). Although there is much debate about the validity and need for statistical analysis in single-case research, Tau-U can effectively support visual analysis (Parker et al., 2011).

Finally, I analyzed procedural fidelity and IOA data using descriptive analysis. To analyze procedural fidelity data, I calculated means and identified ranges across all participants for each condition. To analyze IOA data, I calculated means and identified ranges per condition for each student participant.

CHAPTER 4: RESULTS

In this chapter, I reported the results related to this study. First, I presented the results for IOA and procedural fidelity, then I reported the results for each research question.

Interobserver Agreement

I calculated the IOA data for the points earned for each participant and their challenging behavior across the experimental conditions. A secondary observer reviewed at least 30% of all videos and point cards for each participant across all conditions.

Points

For at least 30% of data collection sessions, a trained observer or I observed video of one academic routine and marked points (i.e., 0, 1, or 2) on a DPR without knowledge of the points the educator assigned. Then, I compared the points I marked to the points the teacher marked. If the points for the routine were different by more than one, I contacted the educator to ask why she assigned the points. Then, the teacher and I reached a consensus on points. Total count IOA (Cooper et al., 2020) was used to calculate IOA for the points a student earned during the target routine for each participant. To calculate IOA, I divided the smaller number of points assigned by the larger number of points assigned and multiplied the quotient by 100. Overall, I collected IOA data on DPR points for 59.3% of baseline sessions and 71.8% of intervention sessions. The mean IOA was 87.2% (range = 50%-100%) during baseline and 85.5% (range = 0% -100%) across traditional and adapted CICO sessions.

Lewis. For Lewis, I calculated IOA data for 65.0% of baseline sessions, 65.0% of CICO sessions, and 50.0% of adapted CICO sessions. The mean IOA was 94.8% (range = 66-100%) for baseline, 84.3% (range = 50-100%) for CICO, and was 79% (range = 50-100%) for adapted CICO.

John. For John, I calculated IOA data for 47.4% baseline sessions, 75.0% of CICO sessions, and 64.7% of adapted CICO sessions. The mean IOA was 83.3% (range = 50-100%) for baseline, 94.4% (range 0-100%) for CICO, and 89.4% (range = 50-100%) for adapted CICO.

Alex. For Alex, I calculated IOA data for 67.8% of baseline sessions, 76.7% of CICO sessions, and 66.7% of adapted CICO sessions. The mean IOA was 87.3% (range 50-100%) for baseline, 82.6% (range = 50-100%) for CICO, and 80.5% (range = 50-100%) for adapted CICO.

Connor. For Connor, I calculated IOA data for 67.4% of baseline sessions, 62.5% of CICO sessions, and 66.7% of adapted CICO sessions. The mean IOA for baseline was 84.6% (range = 50-100%), 90.0% (range = 83.3-100%) for CICO, and 100% for adapted CICO.

Challenging Behavior

For at least 30% of prerecorded sessions, a secondary observer viewed a recording of an academic routine and used partial interval recording to track occurrences of challenging behavior. I compared the secondary observer's data with the primary observer's data and calculated IOA for challenging behavior using an interval-by-interval IOA method (Cooper et al., 2020). Specifically, I calculated IOA for each participant's challenging behavior by dividing the number of intervals with agreement by the total number of intervals. If IOA fell below 85% at any point, the primary and secondary coders met to discuss disagreements by reviewing the videorecording and come to consensus. Overall, I collected IOA data on students' challenging behavior for 45.8% of baseline sessions and 47.9% of intervention sessions. The mean IOA was 94.6% (range = 88.2%-100%) during baseline and 95.7% (range = 84.8% -100%) across traditional and adapted CICO sessions.

Lewis. For Lewis, I collected IOA data for 55.6% of baseline, 45.8% of CICO sessions, and 33.3% of adapted CICO sessions. The mean IOA was 94.1% (range = 84.8-100%) for

baseline, 96.1% (range = 84.8-100%) for CICO, and 95.6% (range = 91.2-100%) for adapted CICO.

John. For John, I collected IOA data for 42.9% of baseline sessions, 44.4% of CICO sessions, and 53.5% of adapted CICO sessions. The mean IOA was 93.7% (range = 88-96%) for baseline, 92.8% (range = 89.8-93.8%) for CICO, and 94.5% (range = 86.7-97.8%) for adapted CICO.

Alex. For Alex, I collected IOA data for 30.4% of baseline sessions, 48.0% of CICO sessions, and 66.7% of adapted CICO sessions. The mean IOA was 93.2% (range = 89.7-96.6%) for baseline, 94.8% (range = 90-98.5%) for CICO, and 95.2% (range = 90.8-100%) for adapted CICO.

Connor. For Connor, I collected IOA data for 48.8% of baseline sessions, 60.0% of CICO sessions, and 33.3% of adapted CICO sessions. The mean IOA was 94.9% (range = 88.2-100%) for baseline, 100.0% for CICO, and 95.2% for adapted CICO.

Procedural Fidelity

I collected procedural fidelity data for at least 25% of sessions during CICO and adapted CICO conditions. For all trainings, the first trained observer collected procedural fidelity data on all trainings with school staff and parents. Procedural fidelity data were collected for 100% of trainings with 100% fidelity. During baseline, the first trained observer and I collected procedural fidelity data on the implementation of Tier 1 supports during 100% of sessions with direct observation data and the fidelity was 100%. During intervention, the first trained observer and I collected procedural fidelity data on the implementation of CICO (i.e., check-in, check-out, assignment of points, feedback, parental component) in addition to the implementation of Tier 1 supports. The first trained observer and I collected procedural fidelity for 56.1% of check-in

sessions (fidelity: *M* = 95.1%, range = 0-100%), 50.9% of check-out sessions (fidelity: *M* = 93.7%, range = 0-100%), 100% of points assignment (fidelity: *M* = 100%), 92.8% of feedback sessions (fidelity: *M* = 95.6%, range = 0-100%), and 100% of sessions for the parental component (i.e., attendance at check-out or signed DPR; fidelity: *M* = 58.1%, range = 0-100%).

Training

Researchers held a total of 10 training sessions, including (a) three individual parent training sessions, (b) two group training sessions for educators on baseline implementation, (c) two group training sessions for educators on intervention implementation, (d) one booster intervention training for educators, and (e) two individual training sessions for mentors. A secondary observer viewed recordings of all training sessions and completed the procedural fidelity checklist for each training (see Appendix X). The checklist consisted of six items, including providing a description of the implementation component, modeling, opportunities for practice, and feedback. The secondary observer circled yes for each step observed. All training sessions were implemented with 100% fidelity.

Tier 1 Implementation

During baseline and intervention conditions, researchers collected procedural fidelity for the implementation of Tier 1 supports through review of 100% of videos of the target routines and teacher self-report. All videos were reviewed for evidence of permanent products (e.g., behavior matrix, posted expectations), teacher use of praise specific to expectations, or direct teaching of expectations. Evidence of Tier 1 support was present in 100% of videos. Additionally, teachers reported implementing Tier 1 supports with 100% fidelity on the bi-weekly survey (see Appendix Z).

CICO Implementation

During CICO implementation, researchers collected procedural fidelity data during at least 25% of sessions to document the degree to which each of the CICO components was implemented correctly. The CICO implementation components being observed included check-in and check-out, assignment of points, feedback, and parental component.

Check-In and Check-Out Sessions. To collect procedural fidelity data, the primary observer for each student participant reviewed the video recording of the check-in or check-out session and completed a procedural fidelity checklist (see Appendix U). The checklist consisted of four steps for check-in and three steps for check-out. A minimum of 25% of check-in and check-out sessions were recorded and viewed for procedural fidelity. For Lewis, I observed 45.7% of check-in sessions and 45.7% of check-out sessions. The mentor implemented check-in with a mean of 96.1% accuracy (range = 66-100%) and implemented check-out with a mean of 97.9% accuracy (range = 66-100%). For John, I observed 53.6% of check-in sessions and 35.7% of check-out sessions. The mentor implemented check-in with a mean of 100% accuracy (range = 0-100%) and implemented check-out with a mean of 93.2% accuracy (range = 66-100%). For Alex, a trained observer observed 75% of check-in sessions and 70% of check-out sessions. The mentor implemented check-in with a mean of 91.7% accuracy (range = 0-100%) and implemented check-out with a mean of 89.3% accuracy (range = 0-100%). For Connor, I observed 27.3% of check-in sessions and 36.3% of check-out sessions. The mentor implemented both check-in and check-out with 100% accuracy across all observed sessions.

Assignment of Points. A trained observer and I reviewed 100% of DPRs they received to ensure the educators completed the card by circling the numbers for each expectation during each activity for the duration of the day. Educators completed the DPRs with 100% fidelity.

Feedback. A trained observer and I reviewed recorded sessions of the target routine for each participant to assess the educators' implementation fidelity of assigning points and feedback. For Lewis, I reviewed 80.0% of feedback sessions following an observation of the target routine. The mean procedural fidelity was 94.1% (range = 0-100%). For John, I reviewed 89.2% of feedback sessions following an observation of the target routine. The mean procedural fidelity was 96% (range = 0-100%). For Alex, a trained observer or I reviewed 52.5% of feedback sessions following an observation of the target routine. The mean procedural fidelity was 95.1% (range = 50-100%). For Connor, I reviewed 81.8% of feedback sessions following an observation of the target routine. The mean procedural fidelity was 100%.

Parental Component. During virtual instruction, the primary observer (the first secondary observer or I) collected procedural fidelity for the parent component by viewing recordings of the check-out sessions. During in-person instruction, procedural fidelity data for the parent component were collected by a review of permanent products for Alex and John or teacher report for Lewis and Connor. Alex's parent signed and returned the DPR or attended the virtual check-out session 100% of the time, John's parent signed and returned the DPR 65.6% of the time, and Lewis' parent signed and returned the DPR 66.7% of the time. Connor's parent, who did not receive training, did not sign and return the DPR.

Results for Research Question 1: What are the effects of traditional six-step CICO on the adherence to schoolwide expectations of students with ASD who have ESN?

Results for Research Question 2: What are the effects of traditional six-step CICO on the challenging behaviors of students with ASD who have ESN?

The primary dependent variable was daily adherence to schoolwide expectations as measured by percentage of points earned on the DPR. Student's challenging behavior during the

target routine (i.e., percentage of intervals of challenging behavior) and adherence to schoolwide expectations for the target routine (i.e., percentage of points earned on the DPR for the target routine) were secondary dependent variables. Figure 2 shows the results for each participant's adherence to schoolwide expectations and challenging behavior across the experimental conditions. Overall, there was minimal change in adherence to schoolwide expectations and challenging behavior during traditional CICO. Lewis and John received two phases of traditional CICO. During the first implementation for Lewis, there was an increase in adherence to schoolwide expectations and a decrease in challenging behavior. This was not replicated with the second implementation. During the first implementation for John, there was minimal change in adherence to schoolwide expectations and challenging behavior. However, when CICO was implemented after a phase of adapted CICO, challenging behavior remained low and adherence to schoolwide expectations remained above acceptable levels for both the target routine and the day. For Alex and Connor, there was minimal change in challenging behavior and adherence to schoolwide expectations during traditional CICO. A functional relation was not established for challenging behavior, adherence to schoolwide expectations for the day, nor adherence to schoolwide expectations during the target routine.

Lewis

I used a reversal design (i.e., A-B-A-B-C) with Lewis. He received two phases of traditional CICO (i.e., one primarily during virtual instruction and one during in-person instruction) before receiving adapted CICO. During the first implementation of CICO, there was an increase adherence to schoolwide expectations, as measured by percentage of points earned for the target routine and the day, and a decrease in challenging behavior. This was not replicated with the second implementation of CICO.

Adherence to Schoolwide Expectations for the Day. The first baseline for Lewis was implemented entirely during in-person instruction. During the first baseline, Lewis earned variable levels of the percentage of points earned on his DPR for the day (M = 77.8%, range = 60.4%-100%, shown in closed circles in Figure 2). Then, intervention began during in-person instruction and continued during virtual instruction. When educators implemented traditional six-step CICO, the mean percentage of points Lewis earned on the DPR increased (M = 94.9%, range = 68.8%-100%), and the stability of data increased. During the second baseline, implemented during in-person and virtual instruction, the mean percentage of points earned decreased slightly (M = 92.8%), and the data were more variable (range = 46.3%-100%). When CICO intervention was reintroduced, during in-person instruction, there was a slight increase in the mean percentage of points earned (M = 95.1%) with an overall high level of stability for all but one data point (range = 57.1%-100%) and no trend.

I calculated an aggregated Tau-U across both baseline and traditional CICO intervention conditions for percentage of points earned on the DPR for the entire day. The aggregated Tau-U was 0.01, 90% confidence interval (CI) = [-0.15, 0.34]. This indicates an overall small positive change in full day adherence to schoolwide expectations. However, this effect was not statistically significant (p = 0.51).

Adherence to Schoolwide Expectations during Target Routine. A similar pattern was observed with the percentage of points earned on Lewis' DPR for the target routine (shown in open circles in Figure 2). During the first baseline, Lewis earned variable levels of the percentage of points on his DPR for the target routine (M = 73.5%, range = 50%-100%). When educators implemented traditional six-step CICO, adherence to schoolwide expectations increased (M = 91%, range = 50%-100%), and the stability of data increased. During the second

baseline, the mean percentage of points earned decreased slightly (*M* = 82%) and the data were more variable (range = 33%-100%). When CICO intervention was reintroduced, there was a slight decrease in the mean percentage of points earned for the target routine (*M* = 79.2%), and data remained variable (range = 0%-100%) with no clear trend.

I calculated an aggregated Tau-U across both baseline and traditional CICO intervention conditions for percentage of points earned on the DPR for the target routine. The aggregated Tau-U was 0.17, 90% confidence interval (CI) = [-0.06, 0.4]. This indicates an overall small increase in adherence to schoolwide expectations during the target routine for Lewis; however, this effect was not statistically significant (*p* = 0.23).

Challenging Behavior. During the first baseline, in which data were collected during virtual and in-person instruction, Lewis displayed low to moderate, variable levels of challenging behavior during the target routine (*M* = 28.6%, range = 0%-47.2%, shown in triangles in Figure 2). When educators implemented traditional six-step CICO during virtual and in-person instruction, Lewis' challenging behavior decreased (*M* = 6.4%), and there was less variability (range = 0%-24.7%). When educators withdrew the intervention during in-person and virtual instruction, Lewis' challenging behavior increased (*M* = 23.2%) with a high level of variability (range = 0%-61.7%). When educators reintroduced traditional six-step CICO during in-person instruction, the effects of intervention were not verified. Lewis' overall challenging behavior remained higher (*M* = 29.5) and variable (range = 3.5%-44.9%) with no clear trend.

I calculated Tau-U across baseline and traditional CICO intervention conditions for percentage of intervals with challenging behavior during the target routine. Tau-U was -0.06, 90% confidence interval (CI) = [-0.32, .21]. This indicates a small decrease in challenging behavior. However, the change was not statistically significant (*p* = 0.72).

John

Adherence to Schoolwide Expectations for the Day. Baseline data were collected for John during virtual and in-person instruction. During the baseline condition, John earned moderate, variable levels of the percentage of points on his DPR for the day (M = 68.4%, range = 41.7%-100%, shown in closed circles in Figure 2). When educators implemented traditional six-step CICO, there was an immediate effect. The mean percentage of points John earned on the DPR for the day increased (M = 83.9%), and the data were highly stable with the exception of the first CICO data point (range = 45%-100%). During the second implementation of traditional six-step CICO after implementation of adapted CICO, adherence to schoolwide expectations for the day remained above acceptable levels (M = 84.7%).

I calculated Tau-U across baseline and traditional CICO intervention conditions for percentage of points earned on the DPR for the entire day. Tau-U was 0.46, 90% confidence interval (CI) = [0.01, 0.92]. This indicates a moderate increase in full day adherence to schoolwide expectations. However, this effect is not statistically significant (p = 0.09).

Adherence to Schoolwide Expectations during Target Routine. A similar pattern was observed with the percentage of points earned on John's DPR for the target routine (shown in open circles in Figure 2). During baseline, John earned moderate, variable levels of the percentage of points on his DPR for the target routine (M = 69.8%, range = 33.3%-100%). When educators implemented traditional six-step CICO, John's overall adherence to schoolwide expectations for the target routine increased (M = 83.5%), and the variability of data remained (range = 50%-100%). During the second implementation of traditional six-step CICO after implementation of adapted CICO, adherence to schoolwide expectations for the target routine remained above acceptable levels (M = 91.7%, range = 88.9%-94.4%) with less variability.

I calculated Tau-U across baseline and traditional CICO intervention conditions for percentage of points earned on the DPR for the target routine. Tau-U was 0.35, 90% confidence interval (CI) = [-0.08, 0.77]. This indicates a moderate positive change in adherence to schoolwide expectations during the target routine. However, this effect was not statistically significant ($p = 0.18$).

Challenging Behavior. During baseline, in which data were collected during in-person and virtual instruction, John displayed low to moderate, variable levels of challenging behavior during the target routine ($M = 21.2\%$, range = 5.1-79.3%, shown in triangles in Figure 2). When educators implemented traditional six-step CICO during in-person instruction, John's challenging behavior increased slightly during the targeted routine ($M = 24.9\%$) with an overall decreasing trend and continued to be variable (range = 8.9%-48.7%). During the second implementation of traditional six-step CICO after implementation of adapted CICO, challenging behavior remained low with little variability ($M = 7.1\%$, range = 5.3%-8.9%).

I calculated Tau-U across baseline and traditional CICO intervention conditions for percentage of intervals with challenging behavior during the target routine. Tau-U was -0.34, 90% confidence interval (CI) = [-0.11, .79]. This indicates a moderate decrease in challenging behavior; however, the change was not statistically significant ($p = 0.22$).

Alex

Adherence to Schoolwide Expectations for the Day. Baseline data were collected during virtual instruction for Alex. During baseline, Alex earned moderate to high levels of the percentage of points earned on his DPR for the day with high level of variability ($M = 73\%$, range = 37.5%-100%, shown in closed circles in Figure 2). Then, intervention was implemented during virtual and in-person instruction. When educators implemented traditional six-step CICO,

the mean percentage of points Alex earned on the DPR for the day increased slightly (*M* = 79.4%), but the data continued to be highly variable (range = 37.5%-100%) with an overall very slight decreasing trend.

I calculated Tau-U across baseline and traditional CICO intervention conditions for percentage of points earned on the DPR for the entire day. Tau-U was 0.19, 90% confidence interval (CI) = [-.06, 0.44]. This indicates a small positive change in full day adherence to schoolwide expectations. However, this effect was not statistically significant ($p = 0.21$).

Adherence to Schoolwide Expectations during Target Routine. A similar pattern was observed with the percentage of points earned on Alex's DPR for the target routine (shown in open circles in Figure 2). During baseline, Alex earned an overall moderate level but highly variable percentage of points earned on his DPR for the target routine (*M* = 70.2%, range = 0%-100%). When educators implemented traditional six-step CICO, Alex's adherence to schoolwide expectations for the target routine was initially more stable with an overall decreasing trend during virtual instruction when compared to the baseline data path, but increased its variability during the in-person instruction (overall *M* = 74.7%, range = 16.7%-100%). There was an overall slight decreasing trend throughout the traditional CICO implementation.

I calculated Tau-U across baseline and traditional CICO intervention conditions for percentage of points earned on the DPR for the target routine. Tau-U was 0.12, 90% confidence interval (CI) = [-0.13, 0.37]. This indicates a small positive change in adherence to schoolwide expectations during the target routine; however, this effect was not statistically significant ($p = 0.44$).

Challenging Behavior. During the baseline condition, in which data were collected during virtual instruction, Alex displayed low levels of challenging behavior with high stability

during the target routine (M = 11.6%, range = 4.9%-22%, shown in triangles in Figure 2). When educators implemented traditional six-step CICO during virtual and in-person instruction, Alex's mean level of challenging behavior decreased slightly (M = 7.9%), but the variability level remained the same with no trend (range = 0.8%-25%).

I calculated Tau-U across baseline and traditional CICO intervention conditions for percentage of intervals with challenging behavior during the target routine. Tau-U was -0.49, 90% confidence interval (CI) = [-0.33, .55], p = .004. This indicates a moderate, statistically significant decrease in challenging behavior.

Connor

Adherence to Schoolwide Expectations for the Day. Baseline data were collected during virtual and in-person instruction for Connor. During the baseline condition, Connor initially earned a variable level of the percentage of points earned on his DPR for the day but reached a high level of stability beginning session 30; his mean percentage of points earned on his DPR for the day during baseline was very high (M = 94.4%, range = 57.1%-100%, shown in closed circles in Figure 2). Then, educators implemented traditional CICO intervention during in-person instruction. When educators implemented traditional six-step CICO, the mean percentage of points Connor earned on the DPR for the day increased slightly (M = 98.4%) and the data were stable (range = 93.3%-100%) with no clear trend.

I calculated Tau-U across baseline and traditional CICO intervention conditions for percentage of points earned on the DPR for the entire day. Tau-U was 0.78, 90% confidence interval (CI) = [0.41, 1], p < .001. This indicates a large, statistically significant increase in full day adherence to schoolwide expectations.

Adherence to Schoolwide Expectations during Target Routine. A similar pattern was observed with the percentage of points Connor earned on his DPR for the target routine (shown in open circles in Figure 2). During baseline, Connor earned variable levels of the percentage of points earned on his DPR for the target routine (*M* = 89.5%, range = 16.7-100%). When educators implemented traditional six-step CICO, Connor's overall adherence to schoolwide expectations for the target routine increased (*M* = 97.9%), and data were relatively more stable (range = 83.3%-100%) when compared to the baseline data pattern.

I calculated Tau-U across baseline and traditional CICO intervention conditions for percentage of points earned on the DPR for the target routine. Tau-U was 0.13, 90% confidence interval (CI) = [-0.22, 0.53]. This indicates a small positive change in adherence to schoolwide expectations during the target routine; however, this effect was not statistically significant (*p* = 0.76).

Challenging Behavior. During the baseline condition, in which data were collected during virtual and in-person instruction, Connor displayed a highly variable level of challenging behavior during the target routine with some level of reduction beginning session 46 despite being inconsistent (*M* = 37.8%, range = 0%-89.9%, shown in triangles in Figure 2). When educators implemented traditional six-step CICO during in-person instruction, Connor's challenging behavior increased to a moderate to high level (*M* = 61.7%) and remained variable (range = 21.1%-100%). There was an increasing trend across the four data points during traditional CICO implementation.

I calculated Tau-U across baseline and traditional COCI intervention conditions for percentage of intervals with challenging behavior during the target routine. Tau-U was 0.37, 90% confidence interval (CI) = [-0.08, 0.83]. This indicates a moderate increase in challenging

behavior. However, the change in challenging behavior was not statistically significant (p = 0.17).

Results for Research Question 3: What are the effects of adapted CICO that included evidence-based practices for students with ASD on the adherence to schoolwide expectations of students with ASD who have ESN?

Results for Research Question 4: What are the effects of adapted CICO that included evidence-based practices for students with ASD on the challenging behaviors of students with ASD who have ESN?

If a student did not meet their point goal in 2 out of 4 days or if there was not a decrease in challenging behavior, an increase in percentage of points for the day, and/or an increase in percentage points earned for the target routine, researchers met with special education teachers to plan for adaptations to traditional six-step CICO. Data for all four participants indicated a need for adaptations. Adapted CICO was implemented in person for all student participants. Overall, for Lewis and Alex, there was minimal change in adherence to schoolwide expectations for the routine or the day and challenging behavior during adapted CICO. There was an increase in adherence to schoolwide expectations for the day and routine and a decrease in challenging behavior for John during adapted CICO. Additionally, data were more stable. For Connor, there was an immediate decrease in challenging behavior, and adherence to schoolwide expectations for the day and routine remained high with less variability during adapted CICO. There were not enough replications of effects to demonstrate a functional relation between the adapted CICO and the dependent variables.

Lewis

Because Lewis's challenging behavior did not decrease during the target routine during the second implementation of CICO, I met with Lewis's teacher to plan for adaptations. Adaptations included operationally defined behaviors related to each schoolwide expectation, visual supports on the DPR, and additional reward for receiving all his points for the target routine. Because Lewis displayed challenging behavior to escape the academic task and access preferred tangibles, the reward for receiving all his points was a preferred tangible of his choosing (e.g., firetruck, book, candy) and was delivered immediately after the target routine. See Appendix M for Lewis's DPR.

Adherence to Schoolwide Expectations. When traditional CICO intervention was reintroduced (beginning session 51) during in-person instruction, there was a slight increase in percentage of points earned on the DPR for the day (M = 95.1%, range 57.1%-100%, shown in closed circles in Figure 2) when compared to the mean percentage of points earned for the day during the second baseline (M = 92.8%). However, there was a slight decrease in percentage of points earned for the target routine (M = 79.2%, shown in open circles in Figure 2), and data remained variable and inconsistent across the traditional CICO implementation (range = 50%-100%). During adapted CICO, the percentage of points earned on the DPR for the day remained the same (M = 95.3%) with less variability (range = 88.9%-100%). However, there was a decrease in the mean percentage of points earned for the target routine (M = 72.9%), and the data remained variable (range = 50%-100%).

I calculated Tau-U across traditional and adapted CICO conditions for percentage of points earned on the DPR for the day and target routine. For the percentage of points earned on the DPR for the day, Tau-U was -0.26, 90% confidence interval (CI) = [-0.66, 0.15]. This

indicates a moderate decrease in percentage of points earned for the day. However, the change was not statistically significant ($p = 0.30$). For the percentage of points earned on the target routine, Tau-U was -0.34, 90% confidence interval (CI) = [-0.73, 0.06]. This indicates a moderate decrease in percentage of points earned during the target routine. However, the change was also not statistically significant ($p = 0.16$).

Challenging Behavior. During the second implementation of traditional six-step CICO during in-person instruction, Lewis' challenging behavior remained at low to moderate level (M = 29.5%) and variable (range = 3.5%-44.9%, shown in triangles in Figure 2). During adapted CICO, Lewis' challenging behavior remained at a similar level with the same level of variability (M = 30.4%, range = 7.3-43.6) and an overall increasing trend.

I calculated Tau-U across traditional and adapted CICO conditions for percentage of intervals with challenging behavior during the target routine. Tau-U was 0.04, 90% confidence interval (CI) = [-0.36, 0.45]. This indicates a small increase in challenging behavior. However, the change in challenging behavior was not statistically significant ($p = 0.87$).

John

Because John's challenging behavior during the designated routine remained inconsistent and unchanged during the first traditional CICO implementation, researchers met with John's teacher to plan for adaptations. Adaptations included operationally defined behaviors related to each schoolwide expectation, green smiley faces to replace the numbers, and an additional check-up midday with an additional reward. An additional midday check-up was chosen because, according to data from the FBA, John displayed challenging behavior to obtain adult attention. The additional check-up increased the individual adult attention he received on a consistent schedule. See Appendix M for John's DPR.

Adherence to Schoolwide Expectations. When educators implemented traditional six-step CICO beginning session 69, the percentage of points John earned on the DPR for the day increased (*M* = 83.9%), and the data were less variable (range = 45%-100%, shown in closed circles in Figure 2). Additionally, John's adherence to schoolwide expectations for the target routine increased (*M* = 83.5%), and the stability of data increased (range = 50%-100%, shown in open circles in Figure 2). When educators implemented adapted CICO, points earned for the entire day and for the target routine increased with higher levels of stability when compared to that of the first traditional CICO implementation. After 5 days of adapted CICO, John began ABA therapy, and came to school two days a week instead of four. Data after therapy remained highly variable and lower for six sessions. After the six sessions, percentage of points earned on the DPR for the day and target routine increased with decreased variability. Across all adapted CICO session days, John received a mean of 81.5% (range = 51.4%-100%) of points for the day and a mean of 86.4% (range = 38.9%-100%) of points on his DPR for the target routine. The mean percentage of points for the day (84.7%) and the mean percentage of points for the target routine (91.7%, range = 88.9%-94.4%) continued to increase slightly when adaptations were withdrawn and educators implemented traditional six-step CICO.

I calculated Tau-U across traditional and adapted CICO conditions for percentage of points earned on the DPR for the day and target routine. For the percentage of points earned on the DPR for the day, Tau-U was -0.13, 90% confidence interval (CI) = [-0.60, 0.32]. This indicates a small decrease in percentage of points earned on the DPR for the day. However, the change was not statistically significant ($p = 0.62$). For the percentage of points earned on the target routine, Tau-U was 0.13, 90% confidence interval (CI) = [-0.31, 0.55]. This indicates a

small increase in percentage of points earned on the DPR for the target routine. However, the change was not statistically significant ($p = 0.18$).

Further, I calculated Tau-U across adapted CICO and the second six-step traditional CICO conditions for percentage of points earned on the DPR for the day and target routine. For the percentage of points earned on the DPR for the day, Tau-U was -0.06, 90% confidence interval (CI) = [-1, 0.95]. This indicates a small decrease in percentage of points earned on the DPR for the day. However, the change was not statistically significant ($p = 0.92$). For the percentage of points earned on the target routine, Tau-U was -0.22, 90% confidence interval (CI) = [-0.95, 0.50]. This indicates a moderate decrease in percentage of points earned on the DPR for the target routine. However, the change also was not statistically significant ($p = 0.61$).

Challenging Behavior. When educators implemented traditional six-step CICO during in-person instruction, John's percentage of intervals with challenging behavior (shown in triangles in Figure 2) increased slightly during the targeted routine ($M = 24.9\%$) and continued to be variable (range = 8.9%-48.7%) when compared to his challenging behavior during baseline. When educators implemented adapted CICO, percentage of intervals with challenging behavior decreased ($M = 15.3$) but continued to be variable (range = 2.1%-50.3%). Initially, the percentage of intervals of challenging behavior decreased immediately during adapted CICO implementation. After 5 days of adapted CICO, John began ABA therapy, and came to school two days a week instead of four. Data after therapy were more variable with no clear trend, but the percentage of intervals of challenging behavior reduced to a lower level with higher stability beginning session 67. The mean percentage of intervals of challenging behavior decreased with less variability when educators withdrew adaptations and implemented traditional six-step CICO ($M = 7.1$, range = 5.3%-8.9%).

I calculated Tau-U across traditional and adapted CICO conditions for percentage of intervals of challenging behavior and Tau-U was -0.58, 90% confidence interval (CI) = [-0.97, -0.19]. This indicates a moderate, statistically significant (p = 0.03) decrease in challenging behavior. I also calculated Tau-U across adapted CICO and the second implementation of traditional six-step CICO conditions for percentage of intervals of challenging behavior. Tau-U was -0.47, 90% confidence interval (CI) = [-1, 0.27], which indicates a moderate decrease. However, the change was not statistically significant ($p = 0.09$).

Alex

Because Alex did not consistently meet his point goal (i.e., 80%) for the day or the target routine, researchers met with his teacher to plan for adaptations. Original adaptations included additional rewards (i.e., candy, which was identified as a preferred item by the parent and teacher) after each academic routine, operationally defined behaviors related to the schoolwide expectations, visual supports for the operationally defined behaviors, and a social narrative read to him by the mentor during check-in. These specific supports were chosen because Alex returned to in-person instruction after 7 months of virtual instruction (i.e., session 51) and began to display different challenging behaviors. After three sessions of implementing the original adaptations, there was no change in challenging behavior and his earned points for the day and the target routine decreased. The researchers met with the teacher again to discuss adding a function-based reinforcer. Because, according to data from the FBA, Alex demonstrated challenging behaviors to escape task demands, the team decided he could earn a break (i.e., outdoor recess) for meeting his point goal for the first half of the day. Additionally, he earned participation in special area classes, which he viewed as a break, if he demonstrated safe behaviors during the second half of the day.

Adherence to Schoolwide Expectations. When educators implemented traditional six-step CICO during virtual and in-person instruction, the percentage of points Alex earned on the DPR for the day increased slightly (*M* = 79.4%), but the data continued to be variable (range = 37.5%-100%, shown in closed circles in Figure 2) when compared to the baseline data pattern. Similarly, when educators implemented traditional six-step CICO, Alex's adherence to schoolwide expectations for the target routine increased (*M* = 74.7%), but data continued to be variable (range = 16.7%-100%, shown in open circles in Figure 2) with a slight decreasing trend. When educators implemented adapted CICO during in-person instruction, the percentage of points earned for the day (*M* = 77.1, range = 59.1%-90%) and for the target routine (*M* = 66.6, range = 16.7%-100%) decreased and remained variable. Percentage of points earned for the day decreased with an overall increasing trend. The data remained variable with the second set of adaptations. Percentage of points earned for the target routine remained variable when the first and second sets of adaptations were implemented.

I calculated Tau-U across traditional and adapted CICO conditions for percentage of points earned on the DPR for the day and target routine. For the percentage of points earned on the DPR for the day, Tau-U was -0.35, 90% confidence interval (CI) = [-0.71, 0.02]. This indicates a moderate decrease in percentage of points earned on the DPR for the day. However, the change in percentage of points earned on the DPR for the day was not statistically significant ($p = 0.11$). For the percentage of points earned on the target routine, Tau-U was -0.34, 90% confidence interval (CI) = [-0.73, 0.06]. This indicates a moderate decrease in the points earned on the DPR for the target routine. However, the change in points earned on the DPR for the target routine also was not statistically significant ($p = 0.16$).

Challenging Behavior. When educators implemented traditional six-step CICO during virtual and in-person instruction, Alex's mean percentage of challenging behavior decreased slightly (M = 7.9%) but remained variable (range = 0.8%-25%, shown in triangles in Figure 2) in comparison to the baseline data pattern. When educators implemented adapted CICO during in-person instruction, Alex's challenging behavior decreased further (M = 4.8) with slightly decreased variability (range = 1.2-9.6%). Changes were not apparent between the first and second sets of adaptations.

I calculated Tau-U across traditional and adapted CICO conditions for percentage of intervals with challenging behavior during the target routine. Tau-U was 0.11, 90% confidence interval (CI) = [-0.33, 0.55]. This indicates a moderate increase in percentage of intervals with challenging behavior. However, the change was not statistically significant (p = 0.67).

Connor

Because Connor's challenging behavior increased during traditional six-step CICO, researchers met with his teacher to plan for adaptations. Adaptations included operationally defined behaviors related to the schoolwide expectations, visual supports for operationally defined behaviors on the DPR, and a visual supported reminder in the form of a photograph of the student completing work quietly, which was attached to his desk. Because data from the FBA indicated Connor displayed challenging behavior to escape task demands, an additional reward of a break to do a preferred activity was given to Connor if he received all points during the target routine.

Adherence to Schoolwide Expectations. When educators implemented traditional six-step CICO during in-person instruction, the percentage of points Connor earned on the DPR for the day increased slightly (M = 98.4%), and the data were stable (range = 93.3%-100%, shown in

closed circles in Figure 2), and Connor's percentage of points earned on the DPR for the target routine increased (*M* = 97.9%), and data were more stable (range = 83.3%-100%, shown in open circles in Figure 2) when compared to the baseline data pattern. When educators implemented adapted CICO during in-person instruction, the percentage of points Connor earned on the DPR for the target routine and for the day increased to 100% across three sessions.

I calculated Tau-U across traditional and adapted CICO conditions for percentage of points earned on the DPR for the day and target routine. For the percentage of points earned on the DPR for the day, Tau-U was 0.29, 90% confidence interval (CI) = [-0.38, 0.96]. This indicates a moderate increase in percentage of points earned on the DPR for the day; however, the change was not statistically significant ($p = 0.48$). For the percentage of points earned on the target routine, Tau-U was 0.08, 90% confidence interval (CI) = [-0.59, 0.76]. This indicates a small change in the points earned on the DPR for the target routine. However, the change also was not statistically significant ($p = 0.84$).

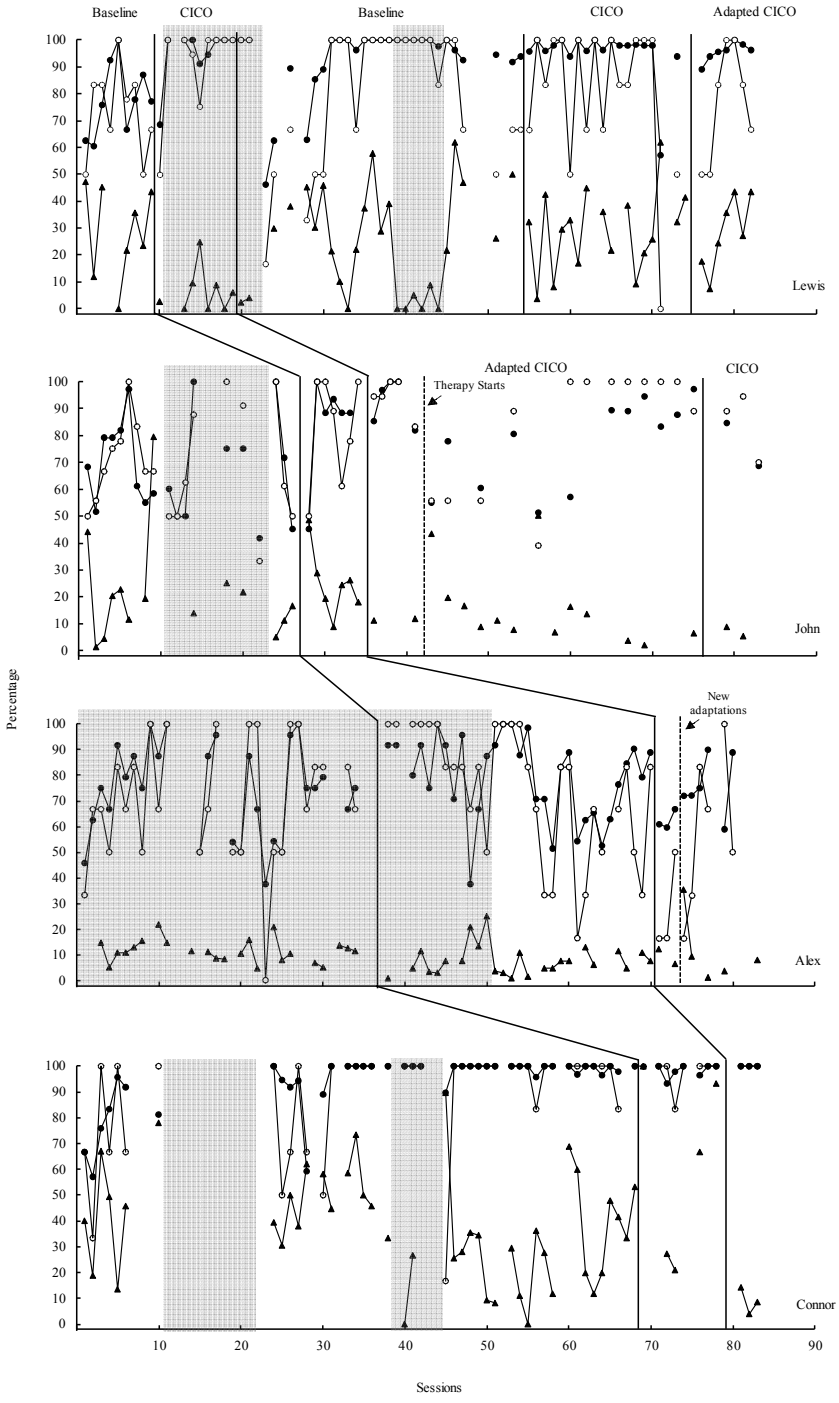
Challenging Behavior. When educators implemented traditional six-step CICO during virtual and in-person instruction, Connor's percentage of intervals of challenging behavior increased (*M* = 61.7%) with an increasing trend and continued to be variable (range = 21.1%-100%, shown in triangles in Figure 2). When educators implemented adapted CICO during in-person instruction, Connor's percentage of intervals of challenging behavior decreased to a low level (*M* = 8.9%) and were highly stable (range = 3.8%-14.3%) when compared to the data pattern during the traditional CICO condition.

I calculated Tau-U across traditional and adapted CICO conditions for percentage of intervals with challenging behavior. Tau-U was -1.0, 90% confidence interval (CI) = [-1, -0.26],

$p = 0.03$. This indicates a very large, statistically significant decrease in percentage of intervals of challenging behavior for the target routine.

Figure 2

Adherence to Schoolwide Expectations and Challenging Behavior



Note: Closed circles represent percentage of points earned for the day on the DPR. Open circles represent percentage of points earned for the target routine on the DPR. Triangles represent percentage of intervals of challenging behavior. Shaded sessions represent virtual instruction.

Results for Research Question 5: What are the perceptions of teachers, students, and parents on the effectiveness and feasibility of traditional 6-step and adapted CICO for students with ASD who have ESN?

I collected social validity data from all participants (i.e., students, parents, teachers, paraprofessionals, and mentors). At the conclusion of the study, I asked all participants to complete a social validity questionnaire about their perceptions of goals, procedures, and outcomes of CICO.

Students

Each student completed a social validity questionnaire one-on-one with a teacher or paraprofessional. The questionnaire for students consisted of four items with two responses supported by visuals supports (i.e., photographs and SymbolStix® pictures). See Appendix S for the social validity form for students. All students indicated they liked meeting with their mentor, earning points, and receiving feedback from teachers. Additionally, all students reported that CICO helped them follow the rules at school.

Teachers, Paraprofessionals, and Mentor

Teachers, paraprofessionals, and one of the mentors completed a 10-question social validity survey through a Google form. The Google form allowed educators/school personnel to submit social validity feedback anonymously. The survey consisted of six 4-point Likert scale (i.e., 1 = *not at all*, 2 = *a little*, 3 = *some*, 4 = *completely*) questions and four open-ended questions. See Appendix R for the school staff social validity questionnaire. Both teachers completed the survey and agreed the goals of the study were somewhat or completely helpful to the student participants' academic and behavioral progress. Also, both teachers agreed the procedures were completely feasible to implement throughout the school day. These responses

were reiterated in their responses to the open-ended question (e.g., "The whole CICO process was easy to implement."). When asked about the effects of CICO on the student participants' challenging and appropriate behaviors, teachers reported the challenging behavior had decreased some, but the appropriate behavior did not increase or increased only a little. However, both teachers reported changes in behavior have made their instruction somewhat easier to deliver. Teachers reported CICO was effective for most participants and agreed adaptations were needed to the traditional process. Teachers also agreed having visuals and the DPR directly related to the school expectations was very helpful. When asked what needed to be changed about the process, teachers only reported issues with the virtual observations and virtual support from the researchers (e.g., uploading videos, logging in for observations). See Table 1 for results of teacher social validity survey.

Two of the four paraprofessional participants responded to the anonymous survey. Both paraprofessionals agreed the goals of the study were somewhat or completely helpful to the student participants' academic and behavioral progress. Both paraprofessionals also agreed the procedures were somewhat or completely feasible to implement throughout the school day. When asked about the effects of CICO on the student participants' challenging and appropriate behaviors, paraprofessionals reported the challenging behavior had decreased some or a lot, and the appropriate behavior increased some or a lot. Additionally, both paraprofessionals reported the changes in behavior made their instruction somewhat or completely easier to deliver. Both paraprofessionals noted the overall effectiveness of the CICO intervention. However, one paraprofessional noted that the effects did not seem to be consistent. When asked what was most helpful about the process, one paraprofessional reported the focus on positive behaviors was helpful, whereas the other noted it was interesting to see if the intervention would be effective.

When asked what could be changed about the process, one paraprofessional noted possibly using different rewards, such as play time or iPad time. See Table 1 for results of paraprofessional social validity survey.

Both mentors were asked to provide feedback on the social validity of the intervention using the same survey as teachers and paraprofessionals. One mentor responded to the request. She indicated the goals of the study were "a little" helpful to the students' academic and behavioral progress. She also agreed the participants' appropriate behaviors increased somewhat, and the participants' challenging behaviors decreased "a little." However, the changes in behavior did make her instruction easier to deliver. Additionally, she perceived the entire process as feasible and the visual supports as most helpful. However, she was unsure "if this student made the connection that his behavior in the classroom [affected] the reward that he would get from the check-in and check-out process." Similar to teachers' responses, she indicated the only thing she would change would be the video recordings. See Table 1 for social validity survey results from the mentor.

Table 1

Teachers', Paraprofessionals', and Mentor's Responses to Social Validity Survey

Question	T1	T2	P1	P2	M
1. To what extent were the goals of this study (i.e., reducing challenging behavior and promoting appropriate behavior) helpful to the participant's behavioral progress?	4	3	4	4	2
2. To what extent were the goals of this study (i.e., reducing challenging behavior and promoting appropriate behavior) helpful to the participant's participation in academic tasks?	3	3	4	3	2
3. To what extent was the intervention feasible to implement throughout the school day?	4	4	4	3	4
4. To what extent has the participant's targeted problem behavior decreased?	3	3	3	4	2
5. To what extent has the participant's appropriate behavior increased?	1	2	3	4	3
6. To what extent have the participant's behavior changes made your instruction/service easier to deliver?	3	3	4	3	3

Note. T = Teacher, P = Paraprofessional, M = Mentor

Parents

The three students' parents, who consented to participate in the study and received training, were asked to complete a social validity questionnaire via a Google form that allowed them to submit responses anonymously. The survey consisted of six 4-point Likert scale (i.e., 1 =

not at all, 2 = *a little*, 3 = *some*, 4 = *completely*) questions and four open-ended questions. See Appendix T for the parent social validity questionnaire. Two parents completed the social validity questionnaire. One parent respondent indicated the goals of the intervention were completely helpful and perceived the intervention as somewhat feasible, also indicating they were somewhat likely to implement a similar intervention at home. Additionally, this parent indicated appropriate behaviors increased some and challenging behaviors decreased some at school. They perceived the communication between school as feasible and most helpful, stating this communication may help the child "realize parents are aware of their behavior." The second parent respondent indicated the goals of the study were "a little" helpful to their child's behavioral progress, and communication between school and home improved some. Although the second parent respondent indicated CICO was very feasible, and they were somewhat likely to implement something similar at home, they indicated their child's challenging behavior did not decrease at all. They reported they would use it again, but the timing (i.e., transitioning between virtual and in-person instruction) probably impacted their child's success with CICO. They suggested more frequent reinforcement may be helpful, because they noticed some change in behavior when their child received a reward twice a day. The parent noted that the most helpful part of the process was the communication between teachers, researchers, and parents and the flexibility of CICO to incorporate new suggestions and adaptations. See Table 2 for social validity survey results from two parents.

Table 2

Parents' Responses to Social Validity Survey

Question	P1	P2
1. To what extent were the goals of this study (i.e., reducing challenging behavior and promoting appropriate behavior) helpful to your child's behavioral progress?	4	2
2. To what extent did Check-In/Check-Out improve communication between school and home?	3	3
3. To what extent was the intervention feasible to implement at home (i.e., sign the point card and speak with your child about his or her behavior)?	3	4
4. To what extent has your child's challenging behavior decreased at school?	3	1
5. To what extent has your child's appropriate behavior increased at school?	3	4
6. How likely are you to implement a similar intervention at home?	3	3

Note. P = Parent

CHAPTER 5: DISCUSSION

The purpose of this study was to investigate the effects of traditional six-step CICO and adapted CICO on the adherence to schoolwide expectations and challenging behavior of elementary students with ASD who have ESN. A multiple baseline across participants design (Ledford & Gast, 2018) with an embedded multiple treatments design was used to examine the effects of the independent variables (i.e., CICO with and without adaptations) on the dependent variables (i.e., adherence to schoolwide expectations and challenging behavior). Effects of the traditional six-step and adapted CICO on adherence to schoolwide expectations were measured by percentage of points earned on the DPR for the day and the target routine. Effects of traditional six-step and adapted CICO on challenging behavior were measured by direct observation using 10 s partial interval recording. To measure social validity, participants (i.e., school staff, parents, and students) completed surveys to report their perceptions of the goals, procedures, and outcomes. Results indicated no to minimal effect of traditional six-step CICO and a small to moderate effect of adapted CICO on the adherence to schoolwide expectations and challenging behavior. Overall, students, parents, educators, and mentors found CICO feasible and would consider implementing it again in the future. In this chapter, I will discuss the study findings, organized by research questions, as well as contributions, limitations, suggestions for future research, and implications for practice.

Research Question 1: What are the effects of traditional six-step CICO on the adherence to schoolwide expectations of students with ASD who have ESN?

Research Question 2: What are the effects of traditional six-step CICO on the challenging behaviors of students with ASD who have ESN?

Visual analysis of graphed data indicated there was minimal effect of traditional six-step CICO on students' adherence to schoolwide expectations and their challenging behavior during a target routine. Lewis's challenging behavior decreased and percentage of points earned on the DPR for the day and the target routine increased with the first implementation of traditional CICO during virtual instruction. However, this was not replicated during the second implementation of traditional CICO during in-person instruction. This could be because Lewis's father provided one-on-one support throughout the session during virtual instruction. I operationally defined off-task behaviors for Lewis as stopping work for more than 8 s or not starting work 4 s after a direction. In the virtual learning environment, Lewis's father would redirect his behavior after 1 s using a louder and more forceful tone than the teacher typically used in the virtual or in-person learning environment. This could have affected his behavior in the virtual learning environment. In an attempt to work on Lewis's independent work skills in the virtual learning environment, the teacher asked his dad to leave his side for the target routine. However, having his father in close proximity could have continued to influence his challenging behavior. For John, there was an increase in percentage of points earned for the day, but this increase was less obvious for the target routine when traditional six-step CICO was in place. According to Tau-U, these changes were moderate, but not statistically significant. Although John's challenging behavior showed an overall decreasing trend during the implementation of traditional six-step CICO, his mean level of challenging behavior increased slightly with much

overlapping with baseline data. For Alex and Connor, there was also minimal change in adherence to schoolwide expectations and challenging behavior when traditional six-step CICO was implemented. Alex received intervention in both the virtual and in-person learning environments, but this did not appear to have an impact on his challenging behavior.

These findings suggest all four participants did not respond to traditional CICO and need further adaptations or additional, more intensive support. Students' lack of positive changes in adherence to schoolwide expectations and in challenging behavior during traditional six-step CICO implementation aligns with previous research that suggests some students (including those with and without disabilities) may be nonresponsive to traditional CICO and that some forms of adaptations would be important to address students' needs (e.g., Campbell & Anderson, 2008; Sobalvarro et al., 2016). Additionally, the lack of response to CICO could be due to the severity of challenging behavior. CICO was originally designed to be implemented for students with nonaggressive behaviors (Crone et al., 2010). Although John and Alex originally met inclusion criteria and did not meet the conditions to withdraw assent, they did display aggressive behaviors at times during the study.

Research Question 3: What are the effects of adapted CICO that included evidence-based practices for students with ASD on the adherence to schoolwide expectations of students with ASD who have ESN?

Research Question 4: What are the effects of adapted CICO that included evidence-based practices for students with ASD on the challenging behaviors of students with ASD who have ESN?

All four student participants received adaptations to traditional CICO. I met with each student's primary teacher to discuss adaptations. Lewis received adapted CICO because his

challenging behavior did not decrease with the second implementation of traditional six-step CICO. With adapted CICO, there was minimal change in percentage of points earned on the DPR for the day or the designated interval and challenging behavior. John received adapted CICO because his challenging behavior remained inconsistent during the target routine during the first implementation of traditional CICO. After several weeks to adjust to his new therapy schedule, the percentage of points earned on the DPR for the day and target routine increased slightly and were more stable with adapted CICO. Percentage of intervals of challenging behavior decreased and were also more stable.

Alex received adapted CICO because he did not consistently meet his point goal, particularly during in-person instruction with an overall decreasing trend for both points earned on the DPR for the day and target routine. The trained observer also noticed an increase in aggressive behaviors and attempted aggression. After 4 days of implementing additional supports to help him learn the expectations (e.g., visual supports, social story), there was no change in challenging behavior or adherence to schoolwide expectations. The team decided to add function-based rewards. However, there was minimal change in the percentage of points earned on the DPR for the day or the routine and percentage of intervals of challenging behavior. Connor received adapted CICO because his percentage of intervals of challenging behavior during the target routine increased with traditional six-step CICO implementation. With three sessions of adapted CICO implementation, Connor continued to meet his point goal with earning of 100% on the DPR for the day and target routine. Additionally, there was a very large, statistically significant decrease in challenging behavior.

Previous research suggests students with ESN, especially those with ASD, have higher support needs related to social behavior than typically developing peers and peers with

intellectual disability (Shogren et al., 2016, 2017). This was reflected in this study. Results across the four student participants showed that there were minimal changes in the level of challenging behavior and adherence to schoolwide expectations with the implementation of the traditional six-step CICO. Specifically, the decrease in challenging behavior and increase in adherence to schoolwide expectations was not sufficient and, for some students, did not occur at all (i.e., Alex and Connor). To meet the support needs of the student participants, several adaptations were made for each student. Adaptations included function-based reinforcers, additional check-ups, and visual supports. These adaptations are consistent with suggested supports in previous studies (e.g., Boden et al., 2018; Campbell & Anderson, 2008; Majeika et al., 2020; Sobalvarro et al., 2006). Once I implemented adapted CICO, there was a decrease in challenging behavior and an increase in adherence to schoolwide expectations during the target routine and the day for John and Connor. This could be because the adaptations included evidence-based supports for students with ASD, such as visual supports and more frequent reinforcement (Steinbrenner et al., 2020). Positive changes in John's and Connor's levels of challenging behavior with implementation of adapted CICO may possibly suggest an increased chance of them being exposed to inclusive education in a less restrictive setting, because challenging behavior is a barrier to inclusive education (Roberts & Simpson, 2016). The effectiveness of adapted CICO for John and Connor supports findings from prior studies with students with high incidence disabilities and those without disabilities that adaptations can increase the effectiveness of CICO and lead to behavior changes for students (Campbell & Anderson, 2008; Sobalvarro et al., 2016). However, the data for John were less consistent. This is reflected in previous CICO literature in that some participants continued to display variable

levels of challenging behavior (Campbell & Anderson, 2008; Karhu et al., 2018), and it also may reflect the unique behavioral support needs of students with ASD who have ESN.

Despite positive behavior changes for John and Connor, even with adaptations there was not a consistent decrease in challenging behavior or a consistent increase in adherence to schoolwide expectations for Lewis and Alex. This could be due to several variables that could not be controlled (e.g., changes in learning environment, inconsistent academic demands). Additionally, this could be due to the function of their behaviors (i.e., escape). Some of the previous literature on CICO suggests CICO may be more effective for students with attention-maintained behavior (e.g., Wolfe et al., 2016). Alternatively, this could also indicate a need for more intensive intervention for these students, as demonstrated by previous research that adapted CICO may not be effective for all students (Campbell & Anderson, 2008; Karhu et al., 2018; Swoszowski et al., 2012). Some students will need intensive Tier 3 supports (Sugai & Horner, 2002). Students with ASD who have ESN often have elevated support needs related to social behavior (Shogren et al., 2016; 2017). Lewis and Alex may require Tier 3 interventions to address their support needs for social behavior. This may be particularly important for Alex, who began to display more aggressive behavior after he transitioned to in-person instruction. CICO (with or without adaptations) may not have been the most appropriate intervention to address his social and behavioral needs (Crone et al., 2010).

Research Question 5: What are the perceptions of teachers, students, and parents on the effectiveness and feasibility of traditional 6-step and adapted CICO for students with ASD who have ESN?

The purpose of collecting social validity data in special education research related to behavior analytic procedures is to assess the social significance of the study (Wolf, 1978). In this

study, school staff, students, and parents completed a social validity questionnaire to provide data on the social significance of goals, social appropriateness of procedures, and social importance of outcomes (Wolf, 1978). Overall, teachers and paraprofessionals perceived the goals of the study helpful to the participants' academic and social behavioral progress. They also agreed CICO was feasible to implement throughout the day, and CICO made their instruction somewhat to completely easier to deliver. However, teachers and paraprofessionals perceived mixed effects of the intervention on challenging behavior and appropriate behaviors, noting the importance of the visual supports for Tier 1 and adapted CICO. The mentor who responded to the social validity questionnaire perceived the intervention as entirely feasible. She noted minimal effect on challenging and appropriate behaviors, stating she was unsure if the students understood the connection between the reward and their behavior throughout the day. She also noted the importance of the visual supports. These findings are consistent with previous studies on CICO that included social validity from educators. In previous studies, educators generally found CICO feasible (e.g., Hawken et al., 2007; 2011; Simonsen et al., 2011; Sobalvarro et al., 2016), but are unsure about the impact of the intervention on appropriate and challenging behaviors (Boden et al., 2018; Simonsen et al., 2011; Sobalvarro et al., 2016).

All student participants perceived the intervention as preferred. They liked meeting with the mentor, earning points, and receiving feedback. All students also indicated CICO helped them follow the rules at school. These data of students' perceptions were consistent with previous studies that included social validity data from students (Boden et al., 2018; Hawken et al., 2007; 2011; Karhu et al., 2018) and extended existing literature in that researchers only gathered social validity data from students in about half of the previously reviewed CICO studies.

The two parents who completed the social validity questionnaire reported it was feasible to implement CICO at home and they were somewhat likely to implement a similar intervention at home. Both parents reported CICO improved their child's appropriate behavior at school and noted the importance of the increased school-home communication through CICO; however, one parent indicated the intervention did not decrease their child's challenging behavior at school. Only two of the previously reviewed CICO studies included social validity data from parents. In previous studies, parents indicated they found CICO to be effective in addressing social and academic behavior (Hawken et al., 2007, 2011).

The overall positive perceptions from both parents who completed the social validity questionnaire could be attributed to the parent training. In the current study, parents were asked to participate in the study by attending training, rating behavior, reviewing the DRP, and signing the DPR during in-person instruction or attending check-out during virtual instruction. Research suggests parent participation can increase students' engagement and performance in school (Mo & Singh, 2008). Additionally, research suggests training and coaching is beneficial for parents to implement behavioral practices (Piquero et al., 2014). In this study, parent training led to greater involvement, supporting the findings of Bunch-Crump and Lo (2017). The three parents who attended training and agreed to participate in the study signed the DPR or attended check-out more frequently (65.6%-100% of DPRs returned) compared to the parent who did not participate in the study or attend the training (0% of DPRs returned). Furthermore, Lewis's teacher reported the DPR was one of the few signed papers Lewis's parent returned without additional reminders. This is supported by parents reporting the increased school-home communication being one of the most beneficial components of CICO.

Contributions

This study makes several contributions to the literature on CICO. First, this study serves as a response to the call to action for research related to how to include students with ESN in SWPBIS in the 2006 issue of *Research and Practice for Persons with Severe Disabilities*, with an additional call to action in 2016 (Kurth & Enyart, 2016). While research around SWPBIS and students with ESN is developing, very few intervention studies have examined the effects of SWPBIS on behaviors of students with ESN. Additionally, students with ASD who have ESN are not represented in the CICO literature. Findings from this study suggest some students with ASD who have ESN may benefit from participation in CICO when implemented within a SWPBIS framework. Over time, some students appeared to make the connection between the points, adherence to expectations, and earning rewards, as evidenced by students yelling or arguing when the teacher or paraprofessional circled a 0 or 1 and explained the reasons. This further indicates that some students with ASD who have ESN can benefit from CICO.

Second, parents in this study were trained to implement the home component of CICO. Few studies have attempted to train parents to implement the home component of CICO (i.e., Bunch-Crump & Lo, 2017; Sobalvaro et al., 2015). Parent communication and participation is a critical component of CICO. Findings from this study suggested virtual parent training, following the BST model, may have increased parental participation in CICO. Due to COVID-19 pandemic, all students were learning virtually from home during part of the study. As a result, all families had internet access and Wi-Fi-enabled devices, making the virtual training feasible. Additionally, because training was conducted virtually, the time of the trainings did not have to coincide with the school hours. Trainings were conducted individually with parents at a time

most convenient for them. Three parents attended the virtual training, and they participated in signing the DPR or attending check-out sessions with at least 65% of DRPs returned.

Third, social validity data were collected from all participants (i.e., educators, mentors, parents, students). In the previously reviewed studies, only two studies included social validity data from all participants. Additionally, less than half of the reviewed CICO studies included social validity data from students. In this study, all participants found the goals of CICO important and found CICO feasible. This study contributes to the literature supporting the social validity of CICO.

Fourth, the adaptations to traditional CICO were developed based on data. Data from direct observations and percentage of points received on the DPR were used to inform the need for adaptations. In a previous review, only 9.9% of studies that made adaptations to CICO did so after data indicated adaptations were needed (Mejeika et al., 2020). Additionally, the research team used data from the DPR, teacher input, and IEP information to determine specific adaptations each student needed. Considering multiple sources of data helped the research team make informed decisions about when to implement adaptations and the specific adaptations to make to the traditional six-step CICO process. This study contributes to the literature on adaptations made to CICO based on data gathered during traditional CICO implementation for more effective data-based decision making.

Fifth, this study adds to the literature by incorporating additional measures of appropriate and challenging behavior. Previous CICO studies generally measured challenging behavior and appropriate behaviors through direct observations (e.g., Bunch-Crump & Lo, 2017; Ennis et al., 2012; Karhu et al., 2018), percentage of points earned on the DPR for the day (e.g., Fallon et al., 2017; McCurdy et al., 2007), and/or office disciplinary referrals (e.g., Hawken et al., 2007;

Simonsen et al., 2011). The data from this study indicated the DPR may not be sensitive enough to capture the frequency of challenging behavior for all students (e.g., Connor). This is one of few CICO studies that compared the percentage of points earned on the DPR during the target routine to the percentage of points earned on the DPR for the entire day in addition to direct observations. This allowed the research team to compare a target routine to the entire day and to determine if the student needed adaptations to support then throughout the day or specifically during challenging routines.

Finally, I conducted this study partially in the virtual learning environment. In response to COVID-19, the Center on PBIS (2020) released guidelines for continuing implementation of CICO during virtual learning. Although the Center on PBIS recommended the continuation of support across tiers during virtual learning, there is no known research on PBIS, specifically CICO, implemented in the virtual learning environment. In this study, the educators implemented CICO in the virtual learning environment for Lewis and Alex for part of the CICO implementation sessions. Although I did not observe desired changes in challenging behavior across participants in the virtual learning environment, this study demonstrated the feasibility of implementing CICO with fidelity during virtual learning. Additionally, I conducted all trainings and collected all data virtually. This is unique in the CICO literature.

Limitations

There are several limitations of this study. First, although students had exposure to Tier 1 supports, the accessibility of those supports was not fully evaluated. Because of changes in instruction due to COVID-19, the school's PBIS team recommended teachers explicitly teach the expectations to students in any manner that was accessible and feasible. Specific lesson plans were not implemented schoolwide for the 2020-2021 school year. As a result, the teachers in this

study taught the schoolwide expectations using visual supports that were familiar to students. Additionally, the school's behavior matrix was adapted with visual supports. The researchers assessed the students' access to Tier 1 supports through (a) a biweekly questionnaire sent to teachers via a google form and (b) observations of permanent products (e.g., the adapted behavior matrix) during the behavioral observations. However, the researchers did not assess acquisition of knowledge and understanding of schoolwide expectations. Further, the researchers did not measure the extent to which Tier 1 supports were implemented with fidelity.

Second, students experienced several instructional changes between virtual and in-person instruction due to COVID-19. Throughout the course of the study, students experienced several changes in instructional setting and format. Alex received all instruction virtually from session 1 to session 53 and received in-person instruction beginning session 54. John received all instruction virtually between sessions 11 and 23 and received in-person instruction for the remaining sessions. Lewis and Connor received virtual instruction in sessions 11-23 and 39-44; they received in-person instruction for the remaining sessions. However, Connor only attended virtual instruction once from session 11 to session 23, because his parents worked during the day and his childcare provider did not have access to internet. In an attempt to mitigate the effects of the change in instruction setting, researchers waited 2 weeks after a setting change before presenting a new experimental condition to a student participant. This led to baseline and intervention conditions being much longer than expected.

Third, during virtual instruction, researchers and teachers did not have influence over the home environment. Researchers observed differences in parental involvement in the sessions and how parents addressed challenging behavior (e.g., focusing on praises for appropriate behavior vs. focusing on using reprimands for challenging behavior). Additionally, the workspaces for

each student participant differed greatly at home. Some participants worked in dedicated offices in their home with minimal distractions whereas other student participants worked in common areas of the house while parents balanced between assisting the child and taking care of competing responsibilities (e.g., work, other children, making meals).

Fourth, inconsistencies in implementation may have influenced the effects of the intervention. For example, school staff did not assign points on the DPR the same way. Although most staff were within one point of the primary researcher when assigning points, some staff were consistently one point higher than the researcher while other staff were consistently one point lower than the researcher. Further, the presentation of tasks and the specific academic tasks each student completed as well as the level of support provided varied greatly during the target routine depending on the lead instructor (e.g., teacher or paraprofessional) for the session. Teacher-student relationships also varied across the participants. In some cases, specific teachers or paraprofessionals had a more positive learning history with some participants. As a result, some paraprofessionals reacted to some challenging behaviors more strongly than others or marked points on the DPR differently. Moreover, researchers instructed educators that CICO was in addition to supports already provided. Although teacher-implemented supports were consistent throughout the baseline and intervention phases, some educators did implement other supplemental interventions, such as time-out or additional reinforcement-based programs during in-person instruction during baseline, traditional six-step CICO, and adapted CICO conditions.

A fifth limitation is that I did not measure generalization or maintenance. Because CICO was implemented for the duration of the school day, it was not possible to measure generalization within the school environment. Additionally, it was unknown if student participants displayed challenging behavior outside of the virtual or in-person school setting,

therefore, making it difficult to measure generalization to the home environment outside of the virtual school setting.

Sixth, I was unable to measure the parent component using review of permanent product for all participants. Because the educators were recording the check-in and check-out sessions, I could not always see if the DPR was returned in the backpack or sent home. One teacher collected and saved returned DPRs for John and Alex. However, the DPRs were not saved for Lewis and Connor. As a result, I had to rely on teacher report, making these data potentially less reliable. Therefore, these results should be interpreted with caution.

Seventh, social validity measures could be subjective. Although school staff and parents reported seeing minimal changes in behavior, the data from the social validity questionnaires were primarily positive. Other factors, such as a desire to please the researcher, could have affected the social validity data.

Finally, I relied on attending virtual sessions or teachers' recording of target routines for all observations. At times, I was unable to gather observational data on challenging behavior and procedural fidelity due to technology failures (e.g., wrong meeting invites, internet outages), resulting in some missing data. Similarly, due to the nature of the virtual observations, the times during which I observed and collected procedural fidelity data were consistent, pre-planned, and were limited to one target routine. Thus, it is not possible to determine if CICO was implemented with fidelity for the duration of the entire day.

Suggestions for Future Research

There are several areas of this study that necessitate further research. First, additional research is needed on the effects of CICO on the behaviors of students with ESN. This is the first

study to include students with ESN in CICO within a SWPBIS framework. Additional research is needed to explore the effects of traditional and adapted CICO with students with ESN. Further, additional research is warranted on the inclusion of students with ESN in other Tier 2 interventions. Common Tier 2 interventions included CICO, Check & Connect, and Social Skills Instruction (Lewis et al., 2016; Maggin et al., 2015; Simonsen & Meyers, 2015; Sugai & Horner, 2002). Due to the void of literature in this area, additional research on all Tier 2 interventions for students with ESN is warranted. Similarly, future research should investigate how to include students with ESN in Tier 1 supports of SWPBIS, and the effects of Tier 1 interventions in combination with Tier 2 interventions on the behaviors of students with ESN. The calls to action in the 2006 and 2016 issues of *Research and Practice for Persons with Severe Disabilities* have gone largely unanswered. For example, future research may involve investigation of a more comprehensive tiered SWPBIS model with students with ESN by manipulating baseline (i.e., prior to Tier 1 implementation), Tier 1, and Tier 2 (such as CICO) conditions in a single-case design study to fully evaluate the extent to which students with ESN respond to each of the tiered supports.

Second, this study was conducted in both the virtual and in-person learning environments due to COVID-19. This was a potentially confounding variable. As a result, research on the effects of traditional six-step CICO and adapted CICO should be conducted in traditional school environments (i.e., in person, 5 days per week) and virtual learning environments, separately, to determine their respective effects. Specifically, there is currently a lack of empirical studies on the effectiveness of CICO in the virtual environment. With the increase of students learning virtually, there is an increased need to investigate the effects of CICO in the virtual learning environment.

Third, the role of training for educators and parents should be investigated further. In this study, parents were provided a 20-30 min virtual training and copies of the training materials related to CICO. The three parents who participated and received the trainings returned the DPR more frequently (65.6%-100%) than the parent who did not participate or receive training (0%). This suggests that parent training is a critical component to increasing parental participation in CICO. Additional research is needed on the types and duration of training needed for parents whose children participate in CICO. Additionally, educators were provided a 30-45 min training before baseline and intervention. Although overall levels of procedural fidelity for educator-implemented components were acceptable (i.e., greater than 90%), procedural fidelity ranged from 0%-100%. This may indicate a need for further training.

Fourth, future research should include social validity data from students with ASD who have ESN. Many studies addressing behavioral interventions for students with ASD who have ESN only included social validity data from implementors and caregivers. With an adapted survey, all four student participants were able to provide meaningful social validity feedback on CICO in this study. In the future, researchers should continue to find ways to solicitate social validity data from student participants with ESN, in addition to educators and caregivers. In addition, future research should include more objective measures of social validity. In this study, I used surveys to collect social validity data, which is consistent with the typical measure of social validity in the existing CICO literature (e.g., Hawken et al., 2007; 2011; Sobalvarro et al., 2016). However, results from this study showed that school staff and parents generally rated positively on the social validity surveys, yet similar positive changes in students' behavior were not consistently observed through direct observations. This may indicate the subjectivity nature of social validity surveys. Future studies may consider other methods of collecting social validity

data objectively, such as showing educators not involved in the study videos of student behavior before and after intervention for them to rate the level of students' behavior changes.

Fifth, future research should explore the role of self-monitoring in CICO. Although CICO has the potential to include self-monitoring, students in this study were not explicitly taught to use the DPR as a self-monitoring tool. Future studies should include self-monitoring as a critical component to encourage maintenance of behavior change after CICO.

Finally, future research should explore the effectiveness of different adaptions for students with ESN. In this study, CICO was adapted with evidence-based practices for students with ASD, specifically visual supports, more frequent reinforcement, social narratives, and function-based reinforcers (Steinbrenner et al., 2020). Future studies should include additional evidence-based strategies for students with ASD and evidence-based strategies for other students with ESN.

Implications for Practice

Results from this study provide several implications for practice. First, results from this study suggests CICO may be an efficient and effective alternative way to address the challenging behavior of some students with ESN. Because CICO is effective and efficient to implement, as supported by previous literature and social validity data from educators and parents in this study, educators in schools implementing CICO as a Tier 2 intervention in a SWPBIS framework should consider CICO and adapted CICO prior to implementing individualized behavior support plans for students displaying challenging behavior not supported by Tier 1 alone. Even with adaptations, CICO is often more time and resource efficient than Tier 3 interventions (Majeika et al., 2020; Rodriguez et al., 2015).

Second, because most teachers in schools implementing CICO would be trained in the intervention, CICO could be implemented for students with ESN who attend general education classes without the need for additional training for general educators. Additionally, if educators do need training, training can be conducted with little time and resources. In this study, most educators and the mentors needed one 30-min training to implement CICO and two to three follow-up reminder emails to increase implementation fidelity. This may be feasible for most schools and could be conducted during most teachers' planning time.

Third, CICO could be implemented to increase school-home communication for students with ASD who have ESN and who exhibit challenging behavior. Both parents who completed the social validity questionnaire reported that CICO increased school-home communication. Because many students with ASD who have ESN may have difficulties with communication (Towles-Reeves et al., 2009), the DPR can help parents understand their child's school day, even if the child cannot effectively communicate how their day went at the school. Further, the training method in this study for parents (i.e., one 30-min session based on BST) is feasible and can be easily adopted.

Finally, this study could serve as a model for adaptations to Tier 2 supports within a SWPBIS framework to promote greater inclusion of students with ESN in SWPBIS and the school community. Adaptations used in this study included visual supports, additional check-up, function-based rewards, and increased frequency of rewards. These adaptations are based on evidence-based practices for students with ASD (Steinbrenner et al., 2020) and could potentially be used for students with ASD who have ESN to increase access and meaningful participation to Tier 2 supports. To determine the specific supports needed, educators could adopt the framework

I used in this study (i.e., Bundock et al., 2019) and consider specific, operationally defined target behaviors and how, when, and where to implement additional supports.

Summary

This study evaluated the effects of traditional six-step and adapted CICO on the adherence to schoolwide expectations and challenging behavior of four students with ASD who have ESN. There was minimal change in adherence to schoolwide expectations and challenging behavior for all four students during the implementation of traditional CICO. When adapted CICO was implemented, there was an increase in adherence to schoolwide expectations for one participant (i.e., John), and a decrease in challenging behavior for two participants (i.e., John and Connor). Although there were several limitations, this study contributed to the limited literature base on the inclusion of students with ESN in SWPBIS.

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Appendix A
Parent Email for Student Participation

Date

Dear Sir or Madam,

I am conducting a study as part of a research project at the University of North Carolina at Charlotte. The purpose of the study is to determine the effects of Check-In/Check- Out, a reinforcement-based behavior strategy, on the behavior of students with extensive support needs. Students with extensive support needs include the 1% of students who qualify to take the NC Extend 1 as an alternative to traditional End of Grade testing. The results will be used to understand the behavior support needs of students with extensive support needs within a positive behavior support framework.

In this study, school staff will be trained in Check-In/Check-Out, a common Tier 2 intervention within the School-wide Positive Behavior Intervention and Support (SWPBIS) framework. School staff will them implement Check-In/Check-Out with a student with extensive support needs. Your child will receive the intervention (Check-In/Check-Out) in the environment which they receive instruction (e.g., virtual or in person). Should the instructional environment change at any point in the study, your child will continue to receive the intervention.

The researcher will provide support for adaptations to the traditional Check-In/Check-Out as needed. Your child has been identified by their teacher as someone who may benefit from Check-In/Check-Out. If you are interested in having your child potentially participate in this study, please respond to this email or contact me either by email (mgillis7@uncc.edu) or cell phone (847-302-7940) to discuss further your child's role and participation. You may also contact Dr. Ya-yu Lo (responsible faculty) either by email (ylo1@uncc.edu) or cell phone (704-687-8716) to discuss further your potential role and participation.

Thank you for your time.

Sincerely,

Megan E. Carpenter, M.Ed.
Doctoral Candidate
Department of Special Education and Child Development
University of North Carolina at Charlotte
9201 University City Blvd
Charlotte, NC 28223

Ya-yu Lo, Ph.D.
Professor
Department of Special Education and Child Development
University of North Carolina at Charlotte
9201 University City Blvd

Appendix B
Parental Consent for Student Participation

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

Parent or Legal Guardian Consent for Child/Minor Participation in Research

Title of the Project: The Effects of Check-In/Check-Out on the Behavior of Students with Autism and Extensive Support Needs
Principal Investigators: Megan Carpenter, M.Ed. and Ya-yu Lo, Ph.D. (responsible faculty), University of North Carolina at Charlotte

Your child is invited to participate in a research study. Your child's participation in this research study is voluntary. The information provided is to help you decide whether or not to allow your child to participate. If you have any questions, please ask.

Important information you need to know

- The purpose of this study is to use Check-In/Check-Out, a reinforcement-based strategy, to help your child follow the schoolwide expectations. Throughout the day, your child will meet with a mentor and earn points for following the schoolwide expectations.
- Your child may participate in this study if he/she has an educational eligibility of autism, may be eligible to take the NC Extend 1, and displays challenging, but not aggressive, behavior. Children in this study will be in their typical virtual or in-person learning environment and receive all instruction from their assigned teachers. Your child's routine and schedule will not be impacted by the study.
- Your child will continue to receive all services for which he or she is eligible.
- 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 implement Check-In/Check-Out, a reinforcement-based strategy, to help your child follow the schoolwide expectations. Throughout the day, your child will meet with a mentor and earn points for following the schoolwide expectations.

Why is your child being asked to be in this research study?
You are being asked to allow your child to participate in this study because he/she has an educational eligibility of autism, may be eligible to take the NC Extend 1, and displays challenging, but not aggressive behavior. Your child has been nominated by his/her classroom teacher as a student who may benefit from the intervention.

What will children do in this study?
This study will involve the implementation of Check-In/Check-Out. Check-In/ Check-Out is a reinforcement-based strategy commonly used in schools within a School-Wide Positive Behavior Support Framework. Your child will meet with the mentor (i.e., a school-based staff member) at the beginning of the day to go over schoolwide expectations and your child's point goal for the day. Your child will earn

points throughout the day for following expectations. At the end of each class period, your child's teacher will meet with your child to provide feedback on his/her behavior. At the end of the school day, your child will meet with the mentor to go over the points earned. The mentor will talk to your child about successes and areas for improvement and provide reinforcement. Your child will bring home the point card daily. Although it is not required, we highly encourage you to go over the point card with your child at home daily and sign the point card.

I (Ms. Carpenter) will collect data on your child's behavior and points earned so that we can evaluate the effects of the intervention. Your child will receive the intervention daily, embedded in his or her typical schedule. I will videotape or audiotape the sessions with the mentor, segments of class time, and the teacher giving points to your child so that I can collect and analyze the data and ensure the quality of the intervention. There is nothing your child will need to do differently as a result of being videotaped. The teacher will record virtual lessons. These recordings will be shared with me in a secure manner. I will also ask your child's teacher to provide information such as age, grade level, ethnicity, education eligibility, and assessment results from your child's educational records to help me develop the most effective intervention. All information will be kept confidential. I may use clips from the videos to show the effects of the intervention to other research team members or staff at the school. Your child may be referred to by his/her first name in the clip; all other identifying information will be removed. No one other than myself will be able to identify you and your child in any way. The videos may be used for training of teachers and educational purposes, if you provide permission.

What benefits might children experience?
Although there is no guaranteed benefit, your child may learn to follow schoolwide expectations more consistently. Additionally, findings from this study may benefit your child and other students with disabilities as we better understand how to address the challenging behavior of students with extensive support needs.

What risks might children experience?
There are minimal risks to participate in this study. The research team will ensure your child's safety at all times while supporting your child in learning academic and social skills.

How will information be protected?
We will not use your child's 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. The video recording will record the virtual classroom which means your child's first name will be recorded. We will not record full names of any of the students or the teacher. 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 will use the video recordings after the study is over to train others who may work with children with extensive support needs. For example, we may use the video recordings as part of a professional development training for teachers, therapists, and college students. The video recordings will only be shown 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 child.

Will children receive an incentive for taking part in this study?
Your child 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 decline participation or choose to stop, you and your child will not be penalized and you and your child will not lose any benefits to which you are otherwise entitled. **Your child will continue to receive ALL eligible services and supports as outlined in his/her individual education program (IEP).**

What are my child's/legal ward's rights if he/she takes part in this study?
Participating in this study is voluntary. Even if you decide to allow your child to be part of the study now, you may change your mind and stop his/her participation at any time. You and your child 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 Megan Carpenter at 847-302-7940 or mgillis7@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 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 consent to my child's participation in "The Effects of Check-In/Check-Out on the Behavior of Students with Autism and Extensive Support Needs": ____ Yes _____No

I consent to the use of audiotape and videotape during mentoring sessions, teacher point delivery, and segments of classroom instruction: ____ Yes _____No (Please see a separate videotape 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 C
Multi Use Video Release Form (Minor)

I hereby consent and agree to allow my child to be photographed, audio recorded, and videotaped 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"), while my child is participating in the research " Effects of Check-In/ Check-Out on the Behavior of Students with Autism and Extensive Support Needs" (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 to me or my child. I hereby waive any right to inspect or approve the finished photographs, videos, or recordings and expressly release UNC Charlotte and its Agents, from any and all claims which I, or my child, 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 videos.
I understand that my child's name will not 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 or Parent/Guardian) (Date)

_____ _____
(Printed Name) (Printed Name of Child)

Appendix D
Teacher and Paraprofessional Recruitment Email

Date

Dear Sir or Madam,

I am writing to ask for help in nominating student participants for a study I am conducting as part of a research project at the University of North Carolina at Charlotte. The purpose of the study is to determine the effects of Check-In/Check- Out, a reinforcement-based behavior strategy, on the behavior of students with extensive support needs. Students with extensive support needs include the 1% of students who qualify to take the NC Extend 1 as an alternative to traditional End of Grade testing. The results will be used to understand the behavior support needs of students with extensive support needs within a positive behavior support framework.

In this study, school staff will be trained in Check-In/Check-Out, a common Tier 2 intervention within the School-Wide Positive Behavior Intervention and Support (SWPBIS) framework. School staff will implement Check-In/Check-Out with students with extensive support needs (e.g., students who qualify or could qualify to take the NC Extend 1). The researcher will provide support for adaptations to the traditional Check-In/Check-Out as needed. One or more of your students will be participating in this study.

Please contact me either by email (mgillis7@uncc.edu) or cell phone (847-302-7940) to discuss further your potential role and participation.

Thank you for your time.

Sincerely,

Megan E. Carpenter, M.Ed.
Doctoral Candidate
Department of Special Education and Child Development
University of North Carolina at Charlotte
9201 University City Blvd
Charlotte, NC 28223

Appendix E
Initial Interview/Recruitment Meeting Script for Teachers

The researcher will cover the following throughout the interview/meeting:

Reason for meeting:
"My name is Megan Carpenter, and I am a doctoral student in the Department of Special Education and Child Development at the University of North Carolina at Charlotte. Because you have a student participating in our study on Check-In/ Check-Out, you are being asked to participate in our study. Your participation does not affect your student's participation."

Purpose of study:
"I'd like to explain the purpose of the study. I am interested in evaluating the effects of Check-In/Check-Out on the behavior of students with extensive support needs. If you agree to participate, your role will include:

1. Meeting with a member of the research team to provide demographic information about the student and complete the Functional Assessment Checklist for Teachers and Staff (FACTS) once parental consent has been obtained.
2. Participating in two training sessions on Check-In/Check-Out. The training sessions will take no more than 45 minutes each and will be completed using video or voice call. (There may be an additional meeting on adaptations to Check-In/Check-Out that will last no more than 1 additional hour.)
3. Assigning points and providing brief feedback to the student participant at the end of each designated period throughout the day.
4. Completing a short (e.g., 10 minutes) social validity survey upon completion of the study."

Researcher will ask potential participants to confirm whether they are 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 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 via email or phone. My email is: [provide email] and my phone number is: [provide phone number]."

Appendix F
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

Informed Consent for Participation in Research

Title of the Project: The Effects of Check-In/Check-Out on the Behavior of Students with Autism and Extensive Support Needs

Principal Investigators: Megan Carpenter, M.Ed., and Ya-yu Lo, Ph.D. (responsible faculty), University of North Carolina at Charlotte

You are invited to participate in a research study. Your participation in this research study is voluntary. The information provided is to help you decide whether or not to consent to participate. If you have any questions, please ask.

Important information you need to know

- The purpose of this study is to use Check-In/Check-Out, a reinforcement-based strategy, to help your student follow the schoolwide expectations. Throughout the day, your student will meet with a mentor and earn points for following the schoolwide expectations.
- You are being asked to participate because you have nominated at least one of your students to participate in this study.
- Your student will continue to receive all services for which he or she is eligible.
- 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 use Check-In/Check-Out, a reinforcement-based strategy, to help you student follow the schoolwide expectations. Throughout the day, your student will meet with a mentor and earn points from teachers for following the schoolwide expectations.

Why am I being asked to be in this research study?

You are being asked to be in this study, because you have a student in your class who is a participant in the study.

What will student do in this study? What is my role?

This study will involve the implementation of Check-In/Check-Out. Check-In/Check-Out is a reinforcement-based strategy commonly used in schools within a School-Wide Positive Behavior Support Framework. Your student will meet with the coach (i.e., a school-based staff member) at the beginning of the day to go over schoolwide expectations and your student's point goal for the day. Your student will earn points throughout the day for following expectations. At the end of the school day, your student will meet with the mentor to go over the points earned. The mentor will talk to your student about successes

and areas for improvement and provide reinforcement. Your student will bring home the point card daily. The student's parent, if he/she agrees to participate, will go over the point card with your student at home daily, sign the point card, and provide rewards for meeting the point goal. All of these will take place in a virtual learning environment.

If you agree to participate, your role will include:

1. Meeting with a member of the research team to provide demographic information about the student and complete the Functional Assessment Checklist for Teachers and Staff (FACTS) once parental consent has been obtained.
2. Participating in two training sessions on Check-In/Check-Out. The training sessions will take no more than 45 minutes each. (There may be an additional meeting on adaptations to Check-In/Check-Out that will last no more than 1 additional hour.)
3. Assigning points and providing brief feedback to the student participant at the end of each designated period throughout the day.
4. Completing a short (e.g., 10 minutes) social validity survey upon completion of the study.

The training session will be recorded so that I can collect and analyze the data and ensure the quality of the training. I will videotape or audiotape the sessions with the coach, training, segments of class time, and the teacher giving points to your child so that I can collect and analyze the data and ensure the quality of the intervention. There is nothing you will need to do differently as a result of being videotaped or audiotaped. I will place the camera so only the face of the instructor is shown. All information will be kept confidential. I may use clips from the video recordings to show the effects of the intervention to other research team members or staff at the school. Your student may be referred to by his/her first name in the clip; all other identifying information will be removed. No one other than myself or members of the research team will be able to identify you. The videos may be used for training of teachers and educational purposes, if you provide permission.

What benefits might students experience?

Although there is no guaranteed benefit, your student may learn to follow schoolwide expectations more consistently and provide consistent school-home communication. Additionally, findings from this study may benefit your student and other students with disabilities as we better understand how to address the challenging behavior of students with extensive support needs. You may gain knowledge of strategies to help students learn to follow expectations.

What risks might I experience?

There are no forseen risks to participate in this study.

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. The video recordings will record the classroom which means your name will be recorded. We will not record full names of any of the students or the teacher. If your last name is recorded, it will be trimmed before sharing the video outside the research team for any educational or training purposes. 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 will use the video recordings after the study is over to train others who may work with students with extensive support needs. For example, we may use the video recordings as part of a professional

development training for teachers, therapists, and college students. The video recordings will only be shown 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 student.

Will I receive an incentive for taking part in this study?
You will receive a $50 gift card for your participation at the completion of the study.

What other choices are there if I don't want my student to take part in this study?
If you decline participation or choose to stop, you and your student will not be penalized and you will not lose any benefits to which you are otherwise entitled. **Your student will continue to receive ALL eligible services and supports as outlined in his/her individual education program (IEP).**

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 student 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 Megan Carpenter at 847-302-7940 or mgillis7@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.

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 "The Effects of Check-In/Check-Out on the Behavior of Students with Autism and Extensive Support Needs": ____ Yes _____No
I consent to the use of videotape and audio recordings: ____ Yes _____No (Please see a separate videotape consent form)

_____
Participant Name (PRINT)

_____
Signature Date

_____
Name and Signature of person obtaining consent Date

Appendix G
Multi Use Video Release Form (Adult)

I hereby consent and agree to be photographed, audio recorded, and videotaped 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"), while my child is participating in the research " Effects of Check-In/ Check-Out on the Behavior of Students with Autism and Extensive Support Needs" (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 photographs, videos, or 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 videos.

I understand that my name will not 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
Mentor Recruitment Email

Date

Dear Sir or Madam,

I am conducting as part of a research project at the University of North Carolina at Charlotte. The purpose of the study is to determine the impact of Check-In/ Check- Out, a reinforcement-based behavior strategy, on the behavior of students with extensive support needs. Students with extensive support needs include the 1% of students who qualify to take the NC Extend 1 as an alternative to traditional End of Grade testing. The results will be used to understand the behavior support needs of students with extensive support needs within a positive behavior support framework.

In this study, school staff will be trained in Check-In/ Check-Out, a common Tier 2 intervention within the School-wide Positive Behavior Intervention and Support (SWPBIS) framework. School staff will them implement Check-In/ Check-Out with a student with extensive support needs (e.g., a student who qualifies or could qualify to take the NC Extend 1). The researcher will provide support for adaptations to the traditional Check-In/ Check-Out as needed. One or more of the students in your school will be participating in this study. Your colleagues suggested you may be interested in helping these this student participate in the intervention.

Please contact me either by email (mgillis7@uncc.edu) or cell phone (847-302-7940) to discuss further your potential role and participation.

Thank you for your time.

Sincerely,

Megan E. Carpenter, M.Ed.
Doctoral Candidate
Department of Special Education and Child Development
University of North Carolina at Charlotte
9201 University City Blvd
Charlotte, NC 28223

Appendix I
Initial Interview/Recruitment Meeting Script for Mentor

The researcher will cover the following throughout the interview/meeting:

Reason for meeting:
"My name is Megan Carpenter, 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. Because you have been recommended by your colleagues as a potential coach/mentor for our study on Check-In/Check-Out, you are being asked to participate in our study. Your participation does not affect the student's participation."

Purpose of study:
"I'd like to explain the purpose of the study. I am interested in evaluating the effects of Check-In/Check-Out on the behavior of students with extensive support needs.
If you agree to participate, your role will include:

1. Participating in a training session on Check-In/Check-Out. The training will take no more than 1 hour. (There may be an additional meeting on adaptations to Check-In/Check-Out that will last no more than 1 additional hour.)
2. Meeting with the student participant(s) during arrival and dismissal everyday to provide feedback and reinforcement.
3. Completing a short (e.g., 10 minutes) social validity survey upon completion of the study."

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 J) with the mentor.
"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 via email or phone. My email is: [provide email] and my phone number is: [provide phone number]."

Appendix J
Mentor 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

Informed Consent for Participation in Research

Title of the Project: The Effects of Check-In/Check-Out on the Behavior of Students with Autism and Extensive Support Needs

Principal Investigators: Megan Carpenter, M.Ed., and Ya-yu Lo, Ph.D. (responsible faculty), University of North Carolina at Charlotte

You are invited to participate in a research study. Your participation in this research study is voluntary. The information provided is to help you decide whether or not to consent to participate. If you have any questions, please ask.

Important information you need to know

- The purpose of this study is to use Check-In/Check-Out, a reinforcement-based strategy, to help students follow the schoolwide expectations. Throughout the day, students will meet with you as the coach and earn points from teachers for following the schoolwide expectations.
- You are being asked to participate because you have been nominated by your colleague(s) to be a mentor/coach for the students.
- All students in the study will continue to receive all services for which they are eligible.
- 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 use Check-In/Check-Out, a reinforcement-based strategy, to help elementary students follow the schoolwide expectations. Throughout the day, students will meet with a coach and earn points from teachers for following the schoolwide expectations.

Why am I being asked to be in this research study?

You are being asked to be in this study, because you have been recommended to act as a coach for student(s) in this study.

What will students do in this study? What is my role?

This study will involve the implementation of Check-In/Check-Out. Check-In/ Check-Out is a reinforcement-based strategy commonly used in schools within a School-Wide Positive Behavior Support Framework. As a mentor, you will meet with the participating student(s) individually at the beginning of the day to go over schoolwide expectations and the student's point goal for the day. Students will earn points throughout the day for following expectations. At the end of the school day, you will meet with each participating student to go over the points earned. You will talk to the student about successes and

areas for improvement and provide reinforcement (e.g., verbal praise). The students will bring home the point card daily. The parent of the student, if he/she agrees to participate, will go over the point card with the student at home daily and sign the point card. All of these will take place in a virtual environment.

If you agree to participate, your role will include:

1. Participating in a training session on Check-In/Check-Out. The training session will take no more than 1 hour. (There may be an additional meeting on adaptations to Check-In/ Check-Out that will no more than 1 additional hour.)
2. Meeting with the student participant during arrival and dismissal everyday to provide feedback and reinforcement.
3. Completing a short (e.g., 10 minutes) social validity survey upon completion of the study.

The training session will be recorded so that I can collect and analyze the data and ensure the quality of the training. I will videotape or audiotape your mentoring sessions with students, training, segments of class time, and the teacher giving points to the students so that I can collect and analyze the data and ensure the quality 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 clips from the video recordings to show the effects of the intervention to other research team members or staff at the school. You may be referred to by your last name in the clip; all other identifying information will be removed. No one other than myself or members of the research team will be able to identify you. The videos may be used for training of teachers and educational purposes, if you provide permission.

What benefits might student experience?

Although there is no guaranteed benefit, participating students may learn to follow schoolwide expectations more consistently and provide consistent school-home communication. Additionally, findings from this study may benefit participating students and other students with disabilities as we better understand how to address the challenging behavior of students with extensive support needs. You may gain knowledge of strategies to help students learn to follow expectations.

What risks might I experience?

There are no forseen risks to participate in this study.

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. The video recordings will record the classroom and mentoring sessions which means your name will be recorded. We will not record full names of any of the students or the teacher. If your last name is recorded, it will be trimmed before sharing the video outside the research team for any educational or training purposes. 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 will use the video recordings after the study is over to train others who may work with students with extensive support needs. For example, we may use the video recordings as part of a professional development training for teachers, therapists, and college students. The video recordings will only be shown 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, other teachers, and participating students.

Will I receive an incentive for taking part in this study?
At the conclusion of the study, you will receive a $50 gift card for your participation.

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 will not be penalized and you will not lose any benefits to which you are otherwise entitled. **Participating students will continue to receive ALL eligible services and supports as outlined in their individual education program (IEP).**

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 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 Megan Carpenter at 847-302-7940 or mgillis7@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.

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 "The Effects of Check-In/Check-Out on the Behavior of Students with Autism and Extensive Support Needs": ____ Yes _____No

I consent to the use of videotape and audiotape recordings: ____ Yes _____No (Please see a separate videotape consent form)

_____
Participant Name (PRINT)

_____
Signature Date

_____
Name and Signature of person obtaining consent Date

Appendix K
Parent Participant 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

Informed Consent for Participation in Research

Title of the Project: The Effects of Check-In/Check-Out on the Behavior of Students with Autism and Extensive Support Needs
Principal Investigators: Megan Carpenter, M.Ed., and Ya-yu Lo, Ph.D. (responsible faculty). University of North Carolina at Charlotte

You are invited to participate in a research study. Your participation in this research study is voluntary. The information provided is to help you decide whether or not to consent to participate. If you have any questions, please ask.

Important information you need to know

- The purpose of this study is to use Check-In/Check-Out, a reinforcement-based strategy, to help your child follow the schoolwide expectations. Throughout the day, your child will meet with a coach and earn points for following the schoolwide expectations.
- You are being asked to participate because you have consented for your child to participate in this study.
- Your child will continue to receive all services for which he or she is eligible.
- 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 use Check-In/Check-Out, a reinforcement-based strategy, to help you child follow the schoolwide expectations. Throughout the day, your child will meet with a coach and earn points for following the schoolwide expectations.

Why am I being asked to be in this research study?
You are being asked to be in this study because you have consented to your child's participation in the study. Check-In/Check-Out is designed to improve school-home communication.

What will children do in this study? What is my role?
This study will involve the implementation of Check-In/Check-Out. Check-In/ Check-Out is a reinforcement-based strategy commonly used in schools within a School-Wide Positive Behavior Support Framework. Your child will meet with the mentor (i.e., a school-based staff member) at the beginning of the day to go over schoolwide expectations and your child's point goal for the day via video call. Your child will earn points throughout the day for following expectations. At the end of the school day, your child will meet with his/her mentor to go over the points earned via video call. The mentor will talk to your child about successes and areas for improvement and provide reinforcement. Your child will bring

home the point card daily. As a participant in this study, you will go over the point card with your child at home daily, sign the point card, and provide rewards. You also will be invited to attend a training session on Check-In/Check-Out at your child's school. Although the training is not required, you are encouraged to attend. The training session will last 1 hour, will occur virtually, and date and time will be decided at a future date. (There may be an additional meeting on adaptations to Check-In/Check-Out that will last no more than 1 additional hour.) Additionally, we will ask you to complete a demographic form.

The training session will be recorded so that I can collect and analyze the data and ensure the quality of the training. There is nothing you will need to do differently as a result of being videotaped. All information will be kept confidential. I may use clips from the videos to show the effects of the intervention to other research team members or staff at the school. Your child may be referred to by his/her first name in the clip; all other identifying information will be removed. No one other than myself will be able to identify you. The video recordings may be used for training of teachers and educational purposes, if you provide permission.

What benefits might children experience?
Although there is no guaranteed benefit, your child may learn to follow schoolwide expectations more consistently and provide consistent school-home communication. Additionally, findings from this study may benefit your child and other students with disabilities as we better understand how to address the challenging behavior of students with extensive support needs.

What risks might children or I experience?
There are no foreseen risks to participate in this study.

How will information be protected?
We will not use your or your child's 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. The video recordings will record the classroom segments, training sessions, and coaching/mentoring sessions, which means your child's first name will be recorded. We will not record full names of any of the students or the teachers. 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 will use the video recordings after the study is over to train others who may work with children with extensive support needs. For example, we may use the video recordings as part of a professional development training for teachers, therapists, and college students. The video recordings will only be shown 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 child.

Will I receive an incentive for taking part in this study?
At the conclusion of the study, you will receive at $25 gift card for your participation.

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 child will not be penalized and you will not lose any benefits to which you are otherwise entitled. **Your child will continue to receive ALL eligible services and supports as outlined in his/her individual education program (IEP).**

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 child 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 Megan Carpenter at 847-302-7940 or mgillis7@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.

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 "The Effects of Check-In/Check-Out on the Behavior of Students with Autism and Extensive Support Needs": ____ Yes _____No

I consent to the use of videotape and audiotape recordings: ____ Yes _____No (Please see a separate videotape consent form)

_____
Participant Name (PRINT)

_____
Signature Date

_____
Name and Signature of person obtaining consent Date

Appendix L
Traditional DPR Example

Student Name: **Date:** **2=Great 1=Almost 0=Try Again**

Goal:	Calendar	Literacy	Recess	Lunch	Math	Science / Social Studies	Specials
Be Respectful	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2
Be Responsible	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2
Be Safe	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2
Totals							

Total Points Earned: _____ Daily Goal: _____ Did I meet my goal? YES NO

Comments: Parent Signature _____

Appendix M
Adapted DPR Examples

Name: _Lewis_____ Date: _____
0 = Try again, 1 = almost (needed reminders), 2 = Great!

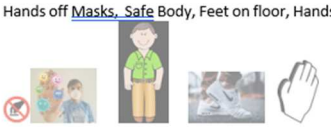
	Morning Meeting	Read Aloud	Math	Foundations	Sight Words	Science/ S. Studies	Folders	Writing	OT	Speech
Be Respectful  Work Quietly	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2 	0 1 2	0 1 2	0 1 2
Be Responsible  Do ALL your work	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2 	0 1 2	0 1 2	0 1 2
Be Safe	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2
Totals										

Point Goal:_____ Total Points Earned:_____ Did I meet my goal?_____
Comments: Parent Signature: _____

Reminders for Scoring
Respectful: followed all directions, including staying in seat
Responsible: completed required work
Safe: did not display aggression, spitting, tipping in chair, leaving classroom/learning area

0 Student did not display behaviors that reflect the expectations, even with significant prompting OR major safety concern
1 met expectation with significant prompting
2 met expectation with little to no prompting

Name: _____John_____ Date: _____

	Morning Group	Reading	Walk or Music	Math	Writing	Break	Lunch	Recess	Math Unique	Unique Reading	Snack	Connect
Be Respectful Markers are for writing  Listen to Teachers 												
Be Responsible Try to do your work 												
Be Safe Hands off Masks, Safe Body, Feet on floor, Hands to self 												
Totals												

Point Goal: _____ Total Points Earned: _____ Did I meet my goal? _____
Comments: Parent Signature: _____

Respectful: followed all directions, including staying in seat, put markers in nose
Responsible: completed required work
Safe: did not display aggression, spitting, tipping in chair, leaving classroom/learning area, touching mask, hitting head
0 Student did not display behaviors that reflect the expectations, even with significant prompting OR major safety concern (hit head)
1 met expectation with significant prompting
2 met expectation with little to no prompting

Name: ___Alex-Morning_____ Date: _____
0 = Try again, 1 = almost (needed reminders), 2 = Great!

	Morning Group	Reading	Math	Writing	Brain Break SOCC
Be Respectful	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2
Be Responsible	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2
Be Safe ⚠	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2
Be safe means ⚠	 I can have nice hands and feet.			 I can keep items on my desk.	
Totals					
I earned Recess 			**Yes!** ✓	**No.** ✗	

Point Goal: 24/30 Total Points Earned: /30 Did I meet my goal?_____

Comments: Parent Signature: _____

Cheat Sheet of Guidelines for Student Behavior

Respectful: followed all directions, including staying in seat Responsible: completed required work
Safe: did not display aggression, spitting, tipping in chair, leaving classroom/learning area
0 Student did not display behaviors that reflect the expectations, even with significant prompting OR major safety concern
1 met expectation with significant prompting 2 met expectation with little to no prompting

---

Name: _Alex-Afternoon_____ Date: _____
0 = Try again, 1 = almost (needed reminders), 2 = Great!

	Smartboard Reading	Lunch	Unique Math	Unique Reading	Snack	Connect
Be Respectful	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2
Be Responsible	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2
Be Safe ⚠	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2
Be safe means ⚠	 I can have nice hands and feet.				 I can keep items on my desk.	
Totals						
I earned Connect 				**Yes!** ✓	**No.** ✗	

Point Goal: /36 Total Points Earned: /36 Did I meet my goal?_____

Comments: Parent Signature: _____

Cheat Sheet of Guidelines for Student Behavior

Respectful: followed all directions, including staying in seat Responsible: completed required work
Safe: did not display aggression, spitting, tipping in chair, leaving classroom/learning area
0 Student did not display behaviors that reflect the expectations, even with significant prompting OR major safety concern
1 met expectation with significant prompting 2 met expectation with little to no prompting

Name: _Connor_____ Date: _____
0 = Try again, 1 = almost (needed reminders), 2 = Great!

	Morning Meeting	Read Aloud	Math	Foundations	Sight Words	Science/ S. Studies	Folders	Writing	OT	Speech
Be Respectful  Work Quietly	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2 	0 1 2	0 1 2	0 1 2
Be Responsible  Do ALL your work	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2 	0 1 2	0 1 2	0 1 2
Be Safe	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2	0 1 2
Totals										

Point Goal: _____ Total Points Earned: _____ Did I meet my goal? _____
Comments: Parent Signature: _____

Reminders for Scoring
Respectful: followed all directions, including staying in seat
Responsible: completed required work
Safe: did not display aggression, spitting, tipping in chair, leaving classroom/learning area

0 Student did not display behaviors that reflect the expectations, even with significant prompting OR major safety concern
1 met expectation with significant prompting
2 met expectation with little to no prompting

Appendix N
Mentor Script

Student Does Not Meet Point Goal	Student Meets Point Goal
"(Student Name), I see you did a great job with being (expectation) in (class). However, you had trouble with (expectation) in (class). What happened? You did not meet your point goal today, but you can try again tomorrow. Tomorrow you can (specific expectation) and meet your point goal."	"(Student name), you did a great job meeting your point goal today. I like how you (behavior specific praise). Keep up the good work!" (Give student reinforcer)

Appendix O
Teacher Script

Student earns mostly 0	Student earns mostly 1	Student earns mostly 2
"(Student name). You did well with (specific behavior or expectation) during (class) today. You earned a 0 for (expectation) because you (specific behavior). Next time, you can (specific behavior) to earn a 2. I know you can do it, so keep trying and working hard."	"(Student name). You did a great job with (specific behavior or expectation). However, you had trouble with (specific behavior and expectation). You earned a 1 for (class). Next time, you can (specific behavior) and keep (rename specific behavior the student did well) to earn your 2."	"(Student name) You did a great job being (expectations today). You (example of specific appropriate behavior). You earned a 2. Keep (specific behavior) and earning 2. Way to go!"

Appendix P
Parent Script

Child did not meet point goal	Child met point goal
"(Child's name). How was your day? (Get DPR out of backpack). I see that you did a great job (name expectation and class). However, I see that you had some trouble at school today meeting the expectations (name specific class and expectation). What can you do tomorrow to meet your point goal? (Offer specific behavior suggestion) Let's have a good/great day tomorrow."	"(Child's name). How was your day? (Get DPR out of backpack). I see that you did a great job (name expectation and class) and you met your point goal! Way to go! That is great! (You could offer preferred item or activity at home if desired. For example, you could say, tonight, you can play on your iPad for 10 min or you can have a cookie after dinner for meeting your point goal today.)"

Appendix Q
Partial Interval Recording Sheet

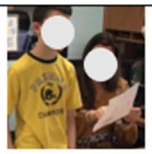
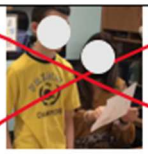
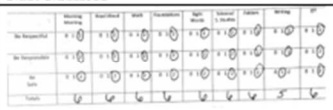
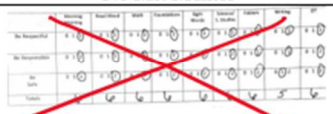
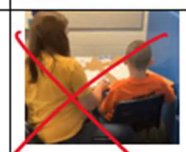
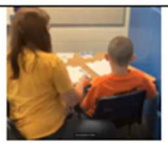
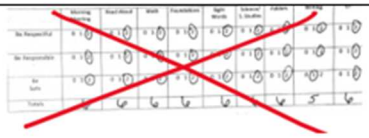
	Interval	CB		Interval	CB		Interval	CB
1	0:01-0:10		55	9:01-9:10		109	18:01-18:10	
2	0:11-0:20		56	9:11-9:20		110	18:11-18:20	
3	0:21-0:30		57	9:21-9:30		111	18:21-18:30	
4	0:31-0:40		58	9:31-9:40		112	18:31-18:40	
5	0:41-0:50		59	9:41-9:50		113	18:41-18:50	
6	0:51-1:00		60	9:51-10:00		114	18:51-19:00	
7	1:01-1:10		61	10:01-10:10		115	19:01-19:10	
8	1:11-1:20		62	10:11-10:20		116	19:11-19:20	
9	1:21-1:30		63	10:21-10:30		117	19:21-19:30	
10	1:31-1:40		64	10:31-10:40		118	19:31-19:40	
11	1:41-1:50		65	10:41-10:50		119	19:41-19:50	
12	1:51-2:00		66	10:51-11:00		120	19:51-20:00	
13	2:01-2:10		67	11:01-11:10				
14	2:11-2:20		68	11:11-11:20				
15	2:21-2:30		69	11:21-11:30				
16	2:31-2:40		70	11:31-11:40				
17	2:41-2:50		71	11:41-11:50				
18	2:51-3:00		72	11:51-12:00				
19	3:01-3:10		73	12:01-12:10				
20	3:11-3:20		74	12:11-12:20				
21	3:21-3:30		75	12:21-12:30				
22	3:31-3:40		76	12:31-12:40				
23	3:41-3:50		77	12:41-12:50				
24	3:51-4:00		78	12:51-13:00				
25	4:01-4:10		79	13:01-13:10				
26	4:11-4:20		80	13:11-13:20				
27	4:21-4:30		81	13:21-13:30				
28	4:31-4:40		82	13:31-13:40				
29	4:41-4:50		83	13:41-13:50				
30	4:51-5:00		84	13:51-14:00				
31	5:01-5:10		85	14:01-14:10				
32	5:11-5:20		86	14:11-14:20				
33	5:21-5:30		87	14:21-14:30				
34	5:31-5:40		88	14:31-14:40				
35	5:41-5:50		89	14:41-14:50				
36	5:51-6:00		90	14:51-15:00				
37	6:01-6:10		91	15:01-15:10				
38	6:11-6:20		92	15:11-15:20				
39	6:21-6:30		93	15:21-15:30				
40	6:31-6:40		94	15:31-15:40				
41	6:41-6:50		95	15:41-15:50				
42	6:51-7:00		96	15:51-16:00				
43	8:01-7:10		97	16:01-16:10				
44	7:11-7:20		98	16:11-16:20				
45	7:21-7:30		99	16:21-16:30				
46	7:31-7:40		100	16:31-16:40				
47	7:41-7:50		101	16:41-16:50				
48	7:51-8:00		102	16:51-17:00				
49	8:01-8:10		103	17:01-17:10				
50	8:11-8:20		104	17:11-17:20				
51	8:21-8:30		105	17:21-17:30				
52	8:31-8:40		106	17:31-17:40				
53	8:41-8:50		107	17:41-17:50				
54	8:51-9:00		108	17:51-18:00				

Total Intervals: ___ Intervals with CB: ___ Percentage of Intervals with CB: ___

Appendix R
Social Validity Questionnaire for Teachers, Paraprofessionals, and Mentors

Item	1 Not at all	2 A little	3 Some	4 Completely
1. To what extent were the goals of this study (i.e., reducing challenging behavior and promoting appropriate behavior) helpful to the participant's behavioral progress?	1	2	3	4
2. To what extent were the goals of this study (i.e., reducing challenging behavior and promoting appropriate behavior) helpful to the participant's participation in academic tasks?	1	2	3	4
3. To what extent was the intervention feasible to implement throughout the school day?	1	2	3	4
4. To what extent has the participant's targeted problem behavior decreased?	1	2	3	4
5. To what extent has the participant's appropriate behavior increased?	1	2	3	4
6. To what extent have the participant's behavior changes made your instruction/service more easily to be delivered?	1	2	3	4
7. What about CICO did you perceive as feasible?				
8. Why did you perceive CICO as effective/ ineffective?				
9. What could be changed in this process?				
10. What was most helpful about this process?				

Appendix S
Social Validity Questionnaire for Students

Did you like meeting with your mentor before and after school?	 Ms. Mentor	 No Ms. Mentor
Did you like earning points?	 Points	 No Points
Did you like your teachers telling you if you are following the rules?	 No talking to teachers	 Talking to teachers
Did CICO help you follow the rules?	 No CICO	 Yes CICO

Appendix T
Social Validity Questionnaire for Parents

Item	1 Not at all	2 A little	3 Some	4 Completely
1. To what extent were the goals of this study (i.e., reducing challenging behavior and promoting appropriate behavior) helpful to your child's behavioral progress?	1	2	3	4
2. To what extent did Check-In/Check-Out improve communication between school and home?	1	2	3	4
3. To what extent was the intervention feasible to implement at home (i.e., sign the point card and speak with your child about his or her behavior)?	1	2	3	4
4. To what extent has your child's targeted problem behavior decreased at school?	1	2	3	4
5. To what extent has your child's appropriate behavior increased at school?	1	2	3	4
6. To what extent has your child's behavior changed at home?	1	2	3	4
7. How likely are you to implement a similar intervention at home?	1	2	3	4
8. What about CICO did you perceive as feasible?				
9. Why did you perceive CICO as effective/ ineffective?				
10. What could be changed in this process?				
11. What was most helpful about this process?				

Appendix U
Check-In/Check-Out Mentor Fidelity Checklist
Adapted from Crone et al. (2010)

Check-In						**Check-Out**				
Date	Check-in Student Present	Delivered DPR	Confirmed daily student materials	Received signed parent copy of DPR		Check-Out (% of points earned)	Met goal	Delivered Verbal praise and reminded of parent provided reward	Gave Positively worded feedback	Sent Parent Copy home with Student or parent attended
	Y N	Y N	Y N	Y N			Y N	Y N	Y N	Y N
	Y N	Y N	Y N	Y N			Y N	Y N	Y N	Y N
	Y N	Y N	Y N	Y N			Y N	Y N	Y N	Y N
	Y N	Y N	Y N	Y N			Y N	Y N	Y N	Y N
	Y N	Y N	Y N	Y N			Y N	Y N	Y N	Y N
	Y N	Y N	Y N	Y N			Y N	Y N	Y N	Y N
	Y N	Y N	Y N	Y N			Y N	Y N	Y N	Y N

Appendix V
Teacher and Paraprofessional Feedback Procedural Fidelity Checklist

Did you mark the student's DRP?	Yes	No	
Did you explain to the student that he/she earned the number of points you circled?	Yes	No	
Did you include examples of appropriate behavior in your explanation?	Yes	No	
Did you include examples of inappropriate behavior in your explanation (if applicable)?	Yes	No	NA
Did you let the student know how he/she can earn full points next time?	Yes	No	
Did you use a positive tone throughout your interaction?	Yes	No	

Appendix W
Baseline Training Case Study Example

Johnny is a 10-year-old boy with autism attending a self-contained class who is receiving CICO. The school's expectations are to be respectful, responsible, and safe. During math, Johnny quietly sits at his desk, but does not finish any of his work. The teacher prompts him several times, he apologizes and starts to work but quickly stops. The teacher knows Johnny has the skills to independently complete the work. At the end of the period, the teacher goes to mark his DPR. What does she mark under respectful, responsible, and safe for math?

Appendix X
School Staff Intervention Training Case Study Example

Kia is a 10-year-old girl with autism attending a self-contained class who is receiving CICO. The school's expectations are to be respectful, responsible, and safe. During PE, Kia runs out of the gym when the teacher turns the music up loudly and refuses to come back in the room once the teacher lowers the music. The assistant prompts her several times to return to class and participate, but Kia screams and refuses. At the end of the period, the assistant goes to mark Kia's DPR. What does she mark under respectful, responsible, and safe for PE? How does she talk to Kia about the points she earned?

Appendix Y
Parent and Mentor Training Point Card Example

 **Student Name:** **Date:** **2=Great 1=Almost 0=Try Again** 

Goal:	Calendar	Literacy	Recess	Lunch	Math	Science / Social Studies	Specials
Be Respectful	0 1 (2)	0 1 (2)	0 (1) 2	0 1 (2)	0 1 (2)	0 1 (2)	0 1 (2)
Be Responsible	0 (1) 2	0 1 (2)	0 1 (2)	0 1 (2)	(0) 1 2	0 (1) 2	0 1 (2)
Be Safe	0 1 (2)	(0) 1 2	(0) 1 2	0 1 (2)	0 1 (2)	0 1 (2)	0 1 (2)
Totals							

Total Points Earned: _____ Daily Goal: _____ Did I meet my goal? YES NO

Comments: Parent Signature _____

Appendix Z
Tier 1 Implementation Checklist for Observations and Teacher Survey

Were the expectations reviewed, posted, or distributed to students today?	Yes	No	No Opportunity
Was your review or display of expectations adapted to meet your students' needs?	Yes	No	Not Applicable
Did you provide acknowledgment for students following the schoolwide expectations today?	Yes	No	No Opportunity
Did you make any adjustments to the schoolwide acknowledgement system to meet your students' needs?	Yes	No	Not Applicable

Appendix AA
Adaptations Problem Solving Worksheet
Adapted from Bundock et al., 2019

Researcher: Summarize Data and state concerns based on data

Researcher Asks: Are you concerned about any other parts of the day?

1. Target Behaviors and Operationally Defined Expectations (Note: researcher and teacher can come up with these together. Some expectations may not have a behavior of concern.)

Expectation	**Behavior of Concern**	**Operational Definition**	**Picture support needed?**
Respectful			
Responsible			
Safe			

2. Additional Supports Needed?
    a. Consider the following
        i. Function-based reinforcers
        ii. Additional check-in
        iii. Additional reinforcement
        iv. Visual supports for numbers
        v. Visual supports for expected behaviors
        vi. Direct instruction in behaviors
        vii. Modeling
        viii. Social Narratives
        ix. Other accommodations or modifications that are already in the IEP
3. Adapt point goal?

New Procedures:

Check-In-

Feedback-

Check-Up-

Check-Out-

Parent Component-