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Effects of a Tier 2 Intervention on Classroom Disruptive Behavior and Academic Engagement

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Abstract

As multi-tiered systems of support for social behavior problems are increasingly utilized in schools settings, school personnel are often in need of effective and efficient Tier 2 interventions. Although Check-in/Check-out (CICO) is a promising intervention, more robust experimental demonstrations are needed to provide evidence confirming its effectiveness when implemented by school practitioners. Using an ABAB single subject design, this study examined the effects of CICO on disruptive behavior and academic engagement of three typically developing elementary school boys who were considered at-risk for escalating problem behavior. CICO was used as part of an ongoing School-wide Positive Behavioral Interventions and Supports program. It was implemented by two classroom teachers and the school counselor, who served as the CICO coordinator. Results indicated that for all three participants, disruptive behavior decreased from baseline levels during intervention phases. Academic engagement increased during CICO phases for two of the three participants. Findings, limitations, and implications for future research and practice are discussed.

Schools increasingly are using multi-tiered systems of support (MTSS) to better meet the academic and social-behavioral needs of all students (e.g., Burns, Appleton, & Stehouwer, 2005; Greenwood, Kratochwill, & Clements, 2008). Multi-tiered models generally consist of three tiers of interventions, with each providing successively more intensive levels of support. Across tiers, MTSS are characterized by the use of data to guide decisions, access to on-going and high quality technical assistance, and team-

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based decision-making (Horner, Sugai, Todd, & Lewis-Palmer, 2005; Lo, Algozzine, Algozzine, Horner, & Sugai; 2010).

For social behavior, Tier 1 interventions include school-wide and class-wide interventions that target all students, involve all school personnel, and cover all of a school's daily routines (Horner, Sugai, & Anderson, 2010). Tier 1 supports are designed to ensure the school environment is predictable (e.g., a common understanding of expected behaviors, a continuum of logical consequences for appropriate and inappropriate behavior), proactive, and safe. At Tier 1, the focus is on teaching and reinforcing the occurrence of desired prosocial behaviors for all students. Tier 2 interventions, intended to supplement Tier 1, are implemented for students who remain at risk for problem behavior even after Tier 1 supports are in place. Tier 2 interventions are used similarly across students who exhibit common behavior problems (e.g., frequently tardy, mild classroom disruptions, organizational difficulties, social skills deficits) and who are likely to respond to similar interventions (e.g., Anderson & Borgmeier, 2010; Hawken, Adolphson, MacLeod, & Schumann, 2009). Finally, Tier 3 supports are for students with significant needs who have not responded to the first two intervention tiers. These students typically benefit from highly individualized interventions guided by functional behavior assessment (Anderson & Scott, 2009; Horner, Sugai, & Anderson, 2010).

A significant body of research has documented effects of Tier 1 and Tier 3 interventions. For example, Tier 1 School-wide Positive Behavior Interventions and Supports (SWPBIS) has been shown to result in increases in standardized test scores and decreases in suspensions, expulsions, and office discipline referrals as well as more positive perceptions of school climate and safety (e.g., Bradshaw, Koth, Bevans, Ialongo, & Leaf, 2008; Bradshaw, Koth, Thornton, & Leaf, 2009; Bradshaw, Mitchell, & Leaf, 2010; Bradshaw, Reinke, Brown, Bevans, & Leaf, 2008; Horner, Sugai, Smolkowski, Eber, Nakasato, Todd, & Esperanza, 2009; Luiselli, Putman, Handler, & Feinberg, 2005).

Within SWPBIS, Tier 3 supports use the functional behavior assessment (FBA) process to determine environmental variables that reliably predict and maintain a student's problem behaviors. This information is then used when designing intervention strategies. A vast literature base has documented that the FBA process results in improved academic (e.g., engagement, standardized test scores) and social behaviors (e.g., disruption, aggression; Flood, Wilder, Flood, & Masuda, 2002; LeGray, Dufrene, Sterling-Turner, Olmi, & Bellone, 2010; Mueller, Edwards, & Trahant, 2003; Waller, Albertini, & Waller, 2011). Although the majority of research has focused on students with school-identified disabilities, the FBA process has also been found to be successful in general education classrooms with students who do not receive special education services (Kamps, Wendland, & Culpepper, 2006; Preciado, Horner, & Baker, 2009).

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At Tier 2, there is some documentation of effectiveness of group-based interventions such as social skills training (Holson, Smith, & Frey, 2008). To date, only two interventions, Check-in/Check-out (CICO; Campbell & Anderson, 2011; Hawken & Horner, 2003) and Check, Connect, and Expect (Cheney, Stage, Hawken, Lynass, Mielenz, & Waugh, 2009) have been evaluated within the context of a MTSS (Anderson & Borgmeier, 2010). Further, only CICO has been evaluated when implemented solely by staff who are a regular part of the school rather than researchers or temporary outside professionals.

Check-in/Check-out

Check-in/Check-out (also known as the Behavior Education Program; Crone, Hawken, & Horner, 2010) used in the present study builds on one school's existing Tier 1 system by providing more frequent and explicit instruction in desired behavior, structured prompts for expected behavior, and frequent feedback concerning a student's social behavior. The standard protocol version of the intervention is implemented similarly across all students participating in CICO in the school, thus creating an efficient system for providing support to multiple students.

Systematic implementation of CICO consists of several specific routines. Each morning upon arrival, the student *checks in* with an adult (CICO coordinator), receives a daily progress card, reviews expectations, and sets a goal for the day. The job of the CICO coordinator may be assumed by various personnel in the school, including general or special education teachers, school counselor, psychologist, social worker, or instructional assistants. Typically, this individual has allocated time at the beginning and ending of each school day to briefly meet with students. After receiving the daily progress report and checking in with the CICO coordinator, the student attends class and receives feedback from teachers at specified times. Teachers award points on a Likert-type scale for meeting school-wide expectations (e.g., safety, respect, responsibility). At the end of the day, the student checks-out with the CICO coordinator, reviews the day, determines whether or not the point goal was met, and then takes the point card home for parent review. A team of school staff regularly reviews student progress and makes decisions about whether to modify, continue, or fade the CICO program. This multidisciplinary team typically includes a general education teacher, a special education teacher, the CICO coordinator, and other relevant individuals (e.g., psychologist, social worker).

To date, the standard protocol version of CICO has been evaluated in six experimental and five quasi-experimental studies. It has been associated with decreases in office discipline referrals (Filter, McKenna, Benedict, Horner, Todd, & Watson, 2007; Hawken, 2006; Hawken, MacLeod, & Rawlings, 2007; Hawken, O'Neill, & MacLeod, 2011), decreases in observed problem behavior during the school day (Campbell & Anderson, 2011; Fairbanks, Sugai, Guardino, & Lathrop, 2007; Hawken & Horner, 2003; March & Horner, 2002; Simonsen, Myers, & Briere, 2011; Todd,

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Campbell, Meyer, & Horner, 2008), and increases in academic engagement (Campbell & Anderson, 2011; Hawken & Horner, 2003; March & Horner, 2002). The effectiveness of CICO has been demonstrated for students in elementary school (Campbell & Anderson, 2008, 2011; Hawken et al., 2007; Hawken et al., 2011) and middle school (Hawken & Horner, 2003; Lane, Capizzi, Fisher, & Ennis, 2012; March & Horner, 2002).

Several studies have documented that CICO is not equally effective for all students. It has been most successful with students who find adult attention rewarding (Campbell & Anderson, 2008; March & Horner, 2002, McIntosh, Campbell, Carter, & Dickey, 2009); although use of an adapted version of CICO was shown to decrease problem behaviors in two elementary school-aged boys whose behaviors were reinforced by peer attention (Campbell & Anderson, 2008). Additionally, a series of recent studies have found CICO successful for students whose problem behavior is maintained by a variety of other functions, including escape from tasks and access to tangibles, particularly if reinforcers were tailored to meet the function of problem behavior (Hawken et al., 2011; Lane et al., 2012).

While the research base for CICO is increasing, there is a continued need for strong experimental studies that examine effects of the standard protocol CICO system. To date, the majority of studies have used single subject research methodology, with only one (Campbell & Anderson, 2011) incorporating a reversal design. Although other single subject designs (i.e., multiple baseline, changing criterion) are experimental, the reversal design is considered to be the most rigorous (Kazdin, 2011).

Therefore, the purpose of the present study was to extend the research base on standard protocol implementation of CICO as a Tier 2 intervention using a single subject reversal design in an elementary school setting. The two research questions were:

1) Is there a functional relation between CICO implementation and reduction in students' disruptive behaviors?
2) Is there a functional relation between CICO implementation and students' increased academic engagement?

Method

Participants and Setting

The present study took place in two general education classrooms in a suburban elementary school located in the Pacific Northwest of the United States. During the academic year of the study, the school had 310 students, 72% of whom qualified for free or reduced-priced lunch. On the state standardized assessment, 77% of third grade students were proficient in reading and 70% of third grade students were proficient in math. For fifth grade students, 48% were proficient in reading and 35% were proficient in math. The school had been implementing School-wide Positive Behavior Interventions and Supports (SWPBIS) for approximately 5 years. This included:

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(a) establishing and teaching behavior expectations (Be Safe, Be Responsible, Be Respectful), (b) implementing a school-wide token economy for rewarding appropriate behavior, and (c) providing a continuum of responses to problem behaviors. During the year of the study, the school met criteria for implementing SWPBIS with fidelity on the School-wide Evaluation Tool, a measure that assesses the fidelity of SWPBIS (Sugai, Lewis-Palmer, Todd, & Horner, 2001). The school had been implementing the CICO program for one year prior to the study; it was implemented with fidelity as assessed by the Check-in/Check-out Self-Assessment (Horner, Todd, & Dickey, 2005).

Participants were three male students who were considered at-risk for escalating problem behavior, but who did not receive special education services. Participant selection occurred in three phases. First, school staff reviewed office discipline referral (ODR) data to identify students who may be eligible for CICO. Students who received between three and five ODRs were selected for possible participation. Next, parental consent, teacher consent, and student assent to participate were obtained. The first three students who met ODR criteria and for whom consent was obtained were selected to participate in the study. A brief Functional Assessment Checklist for Teachers and Staff interview (FACTS: March, Horner, Lewis-Palmer, Brown, Crone, Todd, & Carr, 2000) was then completed by each participant's classroom teacher (i.e., functional behavior assessment instrument used within school's SWPBIS system).

Jacob (pseudonyms were used for all participants) was a 7-year-old Caucasian student who received all academic instruction in a general education second grade classroom. Prior to the beginning of the study, he had received 4 ODRs. His teacher, Mrs. Van, reported that his academic skills were within the average range across all subject areas. Based on information from the FACTS interview, Mrs. Van reported that Jacob displayed behaviors considered to be disruptive (making noises with objects, talking to peers) and noncompliant (verbally refusing to complete assigned tasks) during large group math instruction. Further, she stated that he often received peer attention (peers laughing, engaging in conversation) and adult attention (verbal reprimands) when he engaged in these behaviors. Therefore, it was hypothesized that during independent math work, Jacob engaged in disruptive and noncompliant behaviors in order to obtain peer or teacher attention. Jacob's classroom consisted of 27 other students, Mrs. Van, and a university practicum student who was present approximately three days per week. Mrs. Van had been employed at the school for seven years and had taught second grade for three years. The classroom was organized into clusters of 4 - 5 desks; a typical lesson consisted of teacher-led instruction, group work, and individual student work tasks.

Edwardo, a 10-year-old Latino student, and Fisher, a 10-year-old Caucasian student, received all instruction in the same fifth-grade general education classroom. Mrs. Cruize, their classroom teacher, reported that both boys had academic skills within the average range. During the FACTS interview, Mrs. Cruize reported that Edwardo engaged in disruptive behaviors including talking to peers, making animal noises,

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tapping his pencil on the desk, and telling inappropriate jokes during independent work time. He often received a verbal reprimand from Mrs. Cruize and peer attention (e.g., laughing). Therefore, it was hypothesized that during independent work, Edwardo engaged in disruptive behaviors to obtain teacher and peer attention.

During the FACTS interview, Mrs. Cruize reported that Fisher's disruptive behaviors included talking to peers, talking out, and getting out of his seat during independent work time. He often received verbal reprimands in response to these behaviors. It was hypothesized that during independent work, Fisher engaged in disruptive behaviors in order to obtain teacher and peer attention. Mrs. Cruize also noted that it was common for Edwardo and Fisher to engage in disruptive behaviors together (e.g., talking out of turn to each other) and provide attention to each other.

This classroom included 29 other students, Mrs. Cruize, and an instructional assistant who was present during reading instruction. Mrs. Cruize had been employed as a fifth grade teacher at the present school for 14 years. The classroom was organized in rows of desks, all facing toward the front of the room. Mrs. Cruize utilized a variety of instructional formats, including teacher-directed instruction, independent work, and partner work.

Response Definitions, Data Collection, and Interobserver Agreement

Direct observations of student disruptive behavior and academic engagement were conducted 4 - 5 days per week during the class times that teachers had indicated were most problematic: large group reading instruction for Jacob and independent math work for Edwardo and Fisher. Disruptive behavior was defined as making a noise or physical action irrelevant to the task that other individuals can see or hear. Examples included talking out and talking to peers. Academic engagement was defined as following teacher requests within 10 seconds, orienting eyes toward teacher or relevant materials for academic task, and completing in-class tasks as requested by the teacher.

Data were collected using pen and paper across 15-minute observations using a 5-second partial interval recording system. Data collectors were graduate students in school psychology who had received training in direct behavior observations prior to collecting data. Each observer received a minimum of two hours of training and was required to demonstrate agreement with the first author. During each 15-minute observation, these graduate students recorded disruptive behavior and academic engagement simultaneously. Only one participant was observed at a time in Mrs. Cruize's classroom.

Interobserver agreement was assessed for 37% of observation sessions across all phases of the study for each participant. Total agreement and occurrence only agreement were calculated. Total agreement was calculated by dividing the number of intervals that both observers agreed a response did or did not occur by the number of total intervals and multiplying by 100. Occurrence only agreement was calculated by

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dividing the total number of intervals both observers agreed a response occurred by the number of intervals either observer scored a response and multiplying by 100. For disruptive behavior, total agreement averaged .91 (range, .81-1.0), occurrence only averaged .90 (range, .78-1.0). For academic engagement, total agreement averaged .94 (range, .83-1.0), occurrence only averaged .89 (range, .81-1.0).

Procedures

Baseline. During baseline conditions, all students participated in the SWPBIS system established at their school. School-wide behavior expectations (Be Safe, Be Responsible, Be Respectful) were taught and reviewed on a regular basis throughout the school. These established behavior expectations were used in all settings, including each participant's classroom. In addition, students were given the opportunity to earn rewards by participating in a school-wide token economy system. School staff used *Gotcha Slips*, 3 x 5-inch pieces of paper, to acknowledge students who were observed following specific behavior expectations. Students could turn these slips into the office and be eligible for a weekly drawing. Each week, the principal selected five students to access a variety of tangible or activity-related reinforcers. The classroom teachers for all participants stated that they utilized the schoolwide acknowledgement system; however, data were not collected on the frequency of the teachers' use of the system or whether the participants received Gotcha Slips during the duration of the study.

Check-in/Check-out. All participants took part in the school's standardized intervention, Check-in/Check-out, during treatment conditions. This intervention contained three main components: (1) checking in and out with the CICO coordinator, (2) daily behavior point card, and (3) home report. Although CICO was implemented in the school prior to the present study, the CICO coordinator and participating teachers received a 45-minute refresher training on the procedures within the intervention prior to implementation of the intervention. The CICO coordinator was the school counselor, Ms. Carter. She had been the school's counselor for five years and had served as the CICO coordinator for one year.

Each morning, upon arriving at school, participants individually *checked in* with the CICO coordinator. Students independently walked to her office prior to school beginning. During this brief meeting (approximately 2 minutes with each student), each participant received his daily behavior point card, turned in the previous day's parent report form, and engaged in a short, positive interaction with the CICO coordinator. For example, Ms. Carter greeted the student by saying "I am glad that you are here today" or "Thank you for coming down to see me this morning." Typically, a verbal prompt was also provided (e.g., "Work on raising your hand today") regarding the specific point goal for that day. If the student arrived late to school, he was instructed to first check-in with the coordinator, and then proceed to his classroom. If the student was going to be tardy to class due to checking in, the coordinator gave the student a CICO tardy pass, letting the classroom teacher know to excuse his tardiness. At the end of the day (typically 10

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minutes prior to dismissal), the student independently walked to the coordinator's office for a brief *check-out* session. During this 2 - 3 minute interaction, the student returned his daily progress report and Ms. Carter (1) recorded the number of points earned, (2) completed a parent report, and (3) provided feedback to the student regarding his behavior. If the student met his point goal (80% of possible points earned – the standard goal for all students on CICO in the school), the coordinator provided verbal praise. If the student did not meet his goal, she gave him neutral feedback (e.g., "Let's try to meet the goal tomorrow").

The CICO daily progress report was a 4 x 5-inch piece of cardstock paper (see Figure 1). On each card, there were five opportunities for the student to earn points for appropriate behavior: check-in, mid-morning, lunchtime, mid-afternoon, and check-out. The check-in and check-out opportunities were with the CICO coordinator, while the other three times were with the classroom teacher. Points were earned at check-in and -out for attending the meeting and having the point card. Each teacher determined the time feedback would occur in the classroom based on natural transitions during the day (e.g., before reading, after recess, before lunch, after math). Each participant could earn up to three points for each separate target behavior. Target behaviors were tied to the school's behavior expectations; therefore each student worked to Be Safe, Be Responsible, and Be Respectful. Points were assigned to students using a three point scale: 1 indicated *had a hard time*, 2 indicated *did okay*, and 3 indicated *did great*. Thus, a student could earn up to 15 points at each of five feedback sessions for a total of 45 points per day.

At each feedback session, the student's teacher rated his behavior using the 3-point scale. Teachers provided additional verbal feedback and an explanation of the ratings (e.g., "Great job, you earned a 3 because you completed all of your work."). In addition, the teacher provided pre-correction for the next opportunity to earn points (e.g., "I rated you a 2 for Responsibility because you were talking during reading time. I'm looking for you to have all your materials and talk only during partner time during math so you can earn a 3 for Responsibility this afternoon.").

Participants in the present study also received a home report, as did all students participating in CICO in the school. This report contained the student's name, the date, whether or not he met his goal for percentage of points earned, a place for comments, and a parent signature line. The CICO coordinator completed the form during the afternoon check-out session and gave it to the student to take home. The student was expected to give the report to his parents and obtain a signature. The student then returned the previous day's home report to the coordinator the following morning during check-in. Parents were encouraged to provide positive feedback when a child met the point goal and to refrain from delivering negative consequences if the goal was not met; however, we did not monitor whether this occurred. In this school there were no consequences for adherence to the home component of CICO.

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CICO Record

Name: _____ Date: _____

3 = great 2 = OK 1 = hard time

	Safe	Responsible	Respectful
Check In	3 2 1	3 2 1	3 2 1
Morning:	3 2 1	3 2 1	3 2 1
Lunch	3 2 1	3 2 1	3 2 1
Afternoon:	3 2 1	3 2 1	3 2 1
Check Out	3 2 1	3 2 1	3 2 1
Today's goal		Today's total points	

Comments:

Figure 1. Check-in/Check-out daily progress report.

Fidelity of Implementation

Fidelity of implementation was measured on 34% of days the students participated in CICO. Trained graduate students assessed fidelity by (a) directly observing check-in, classroom rating times, and check-out and (b) completing a fidelity checklist comprised of 12 key features of the intervention (see Table 1). Each item was scored as *present* or *not present*. Interobserver agreement was assessed for 21% of fidelity observations. To assess agreement, two individuals independently observed the intervention implementation. Agreement was calculated by dividing the total number of items that were scored the same by the total number of items. Agreement was 100% for all fidelity observations.

Fidelity of implementation was high across all participants. For Jacob, fidelity was 100% across all observations. For Edwardo, fidelity averaged 98%, with a range of 91% - 100%. For Fisher, fidelity averaged 98%, with a range of 91% - 100%.

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Table 1.
Fidelity Checklist Items

Time/Location	Item
Morning Check-in	Student checked in with adult
	Staff member provided daily point card
	Staff member provided a prompt for the student to be successful that day
	Student turned in home report
Classroom	Student approached teacher to receive feedback
	Teacher assigned points to student
	Teacher provided verbal feedback regarding the student's behavior
Afternoon Check-out	Student checked out with adult
	Student presented complete card to adult
	Staff member added up total points, and recorded
	Staff member provided verbal feedback regarding student's behavior
	Staff member completed the parent report and handed to student

Research Design

The present study employed an ABAB reversal design to document functional control of CICO over disruptive behaviors and academic engagement. Reversal designs are generally considered to be the most robust of single subject designs in evaluating treatment effects, as it is unlikely that confounding variables will occur repeatedly at the same time as the treatment (Kazdin, 2011). As typical in single subject research methodology, visual analysis of the data was used to evaluate the result of the study (Kazdin). This included systematically evaluating the level and variability of the raw data across all phases of the study.

Results

Disruptive Behavior

Figure 2 displays results of disruptive behavior across four phases for each participant. Jacob (top panel) exhibited moderate disruptive behaviors with some

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variability during large group instruction in an average of 35.8% of intervals during baseline (range, 26% - 43%). Upon implementation of CICO, an immediate reduction in problem behavior was observed (*M* = 13.5%; range, 8% - 24%). An increase in level was observed following a brief return to baseline (*M* = 29.8%), although variability was somewhat high (range, 15% - 37%). After CICO was reinstated, disruptive behavior immediately decreased (*M* = 13.5%). Unfortunately, data collection was discontinued after two days because Jacob moved to a different school. Overall, variability was moderate across all phases of the study.

During baseline, Edwardo (Figure 2, middle panel) displayed a moderate level and highly variable disruptive behavior (*M* = 30%; range, 16% - 41%). An immediate reduction in the level (*M* = 7.8%) and variability (range, 7% - 12%) of disruptive behavior was observed when CICO was implemented. During a brief return to baseline, disruptive behavior immediately increased, with an average of 25% of intervals and a range of 14% - 36%. When CICO was reinstated, disruptive behavior immediately decreased (*M* = 7.2%; range, 2% - 11%). Variability was moderate across all phases of the study.

Fisher's disruptive behavior (Figure 2, bottom panel) averaged 22.5% and was highly variable with a range of 0% - 45% of intervals during baseline. An immediate reduction in the level (*M* = 10%) and the variability (range, 2% - 20%) was observed when CICO was implemented. Disruptive behavior returned to baseline levels upon removal of CICO (*M* = 26.5%; range, 17% - 32%). A substantial decrease in disruptive behavior was observed with the reinstatement of CICO (*M* = 10.6%; range, 3% - 10%).

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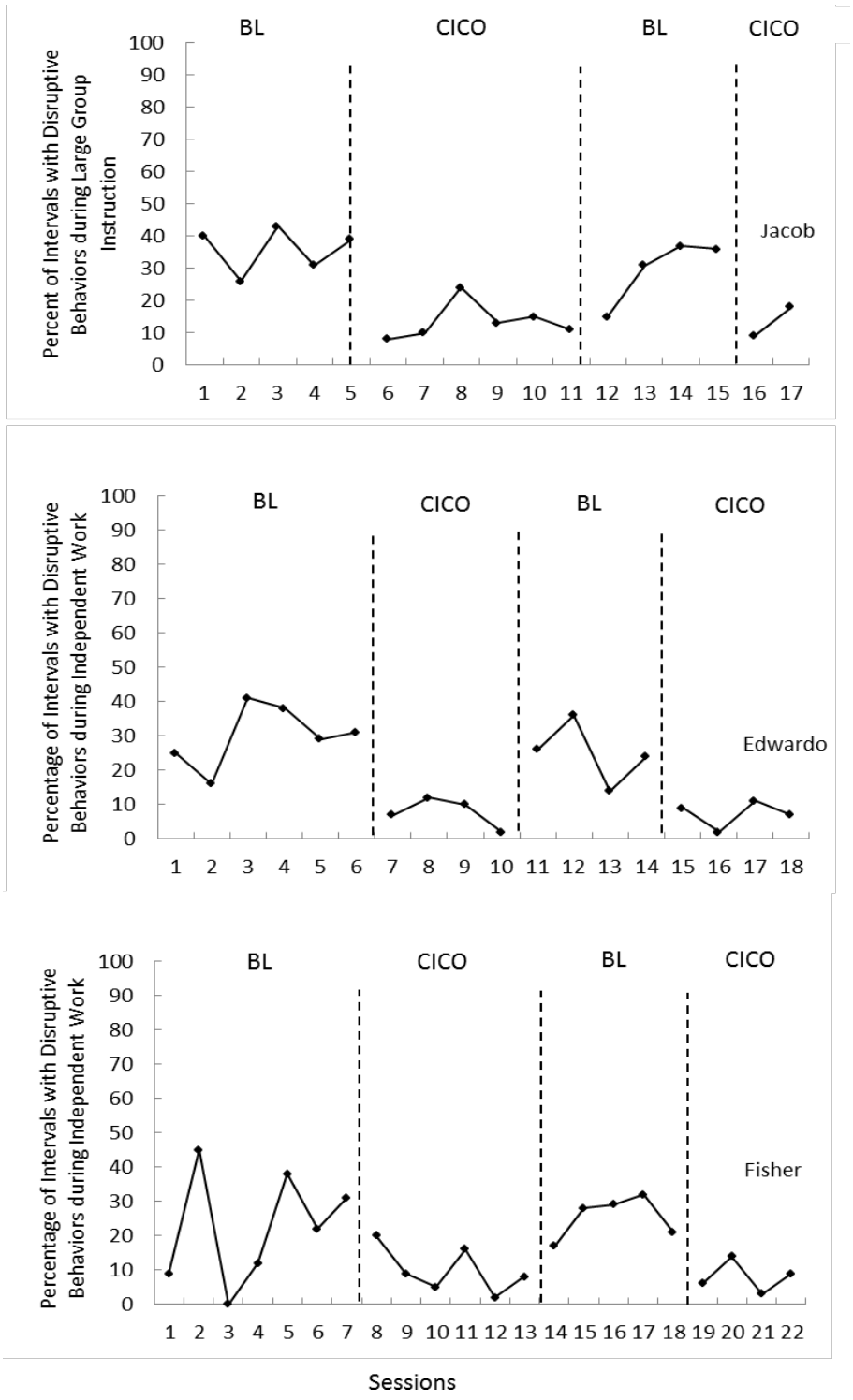

Figure 2. Effects of CICO on disruptive behaviors across three students.

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Academic Engagement

The effects of CICO on academic engagement for all participants is displayed in Figure 3. Jacob's academic engagement (top panel) was moderate (*M* = 70.2%) and somewhat variable (range, 57% -84%) during baseline. An immediate increase in the level (*M* = 84.3%) and a decrease in the variability (range, 74% - 92%) occurred during the initial CICO phase. Following a brief return to baseline, academic engagement decreased in level (*M* = 70%) and increased in variability (range, 74% - 78%). Reinstating CICO resulted in a slight increase in academic engagement (*M* = 76%) and a significant decrease in variability (range, 74% - 78%).

During baseline, Edwardo's academic engagement (middle panel) was low (*M* = 63.3%), and highly variable (range, 46% - 87%). Upon implementation of CICO, academic engagement increased to an average of 74%, however variability continued to remain high (range, 58% - 93%). Academic engagement did not change in level or variability during a brief return to baseline (*M* = 72.5%; range, 56% -93%). A slight increase in level and a decrease in variability were observed upon returning to CICO (*M* = 86.5%; range, 77% - 94%). Overall, although there was a significant change in level of academic engagement, variability remained high throughout all phases of the study.

Fisher's academic engagement was relatively low (bottom panel) (*M* = 66%) and highly variable (range, 40% - 88%) during baseline. A substantial and immediate increase in level and decrease in variability (range, 82% - 97%) was observed upon initial implementation of CICO (*M* = 90.8%). Academic engagement decreased following a brief return to baseline (*M* = 57.5%); however variability increased (range, 44% - 67%). When CICO was reinstated, academic engagement increased slightly (*M* = 75.2%), and remained relatively variable (range, 65% - 83%).

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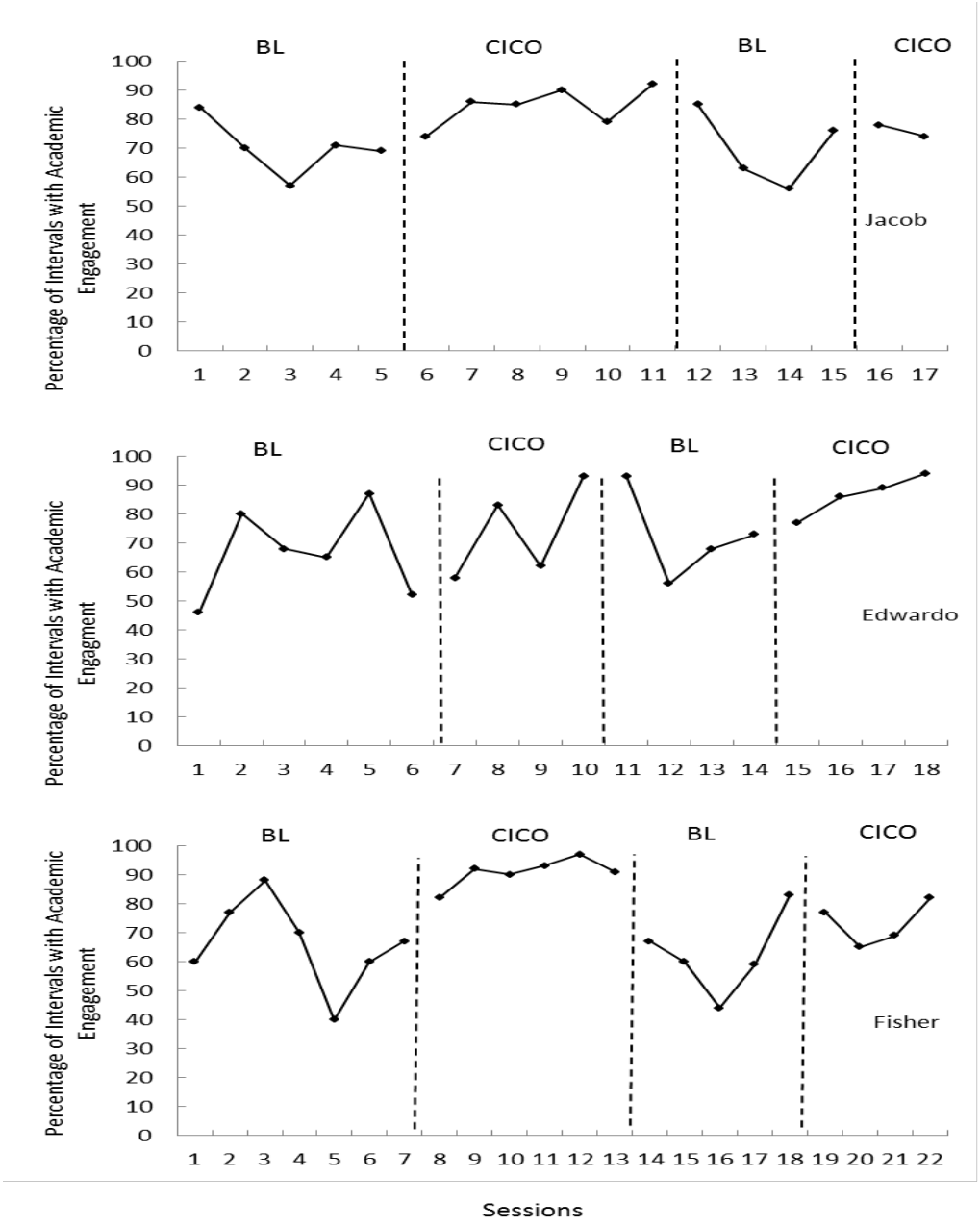

Figure 3. Effects of CICO on academic engagement across three students.

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Discussion

The purpose of the present study was to extend the research base on the standard protocol implementation of CICO as a Tier 2 intervention used in general education classrooms. More specifically, building on previous research, the present study replicated the methodology of Campbell and Anderson (2011) utilizing different participants. Overall, the data in this study support the existence of a functional relation between standard protocol CICO implementation and reduction in student disruptive behavior and increased academic engagement. Implementation of CICO resulted in a decrease in the level and variability of disruptive behaviors across all three participants. Results also indicated that CICO had functional control over academic engagement for Fisher and Jacob. Edwardo's academic engagement did not appear to substantially change as a result of implementation of CICO; however, although we did not systematically evaluate trends in the data, a clear ascending trend in academic engagement during the second phase of CICO indicated improvement.

Conclusions determining a functional relation between CICO and a reduction in disruptive behavior are strengthened by several factors. First of these is the overall strength of the ABAB reversal design replicated for three students. Use of this design across multiple students serves to bolster confidence that a functional relation existed between the intervention and a reduction in problem behavior (Kazdin, 2011).

Another strength of the current study is the inclusion of FBA information to identify a clear hypothesized function of problem behavior prior to implementing CICO. While common implementation of CICO may not involve formal FBA, data for this study provide additional evidence for the effectiveness of CICO for students whose behavior is sensitive to adult attention. This is consistent with previous findings that the standard protocol version of CICO is effective for students whose behavior is maintained by attention. Because each of the participants in the current study exhibited problem behavior hypothesized as being maintained at least in part by adult attention, the observed reduction in problem behavior while the intervention was in place is consistent with previous research (McIntosh et al., 2009). It is possible that CICO addresses students' needs by increasing the amount of contingent adult attention that they receive on a regular basis, therefore decreasing the need to engage in problematic behaviors. It should be noted that only an indirect, descriptive method of FBA was used (i.e., teacher interview). Because the function of each student's problem behavior was not confirmed through an experimental functional analysis, results of the FBA must be interpreted with caution. Therefore, although data supported the hypothesis that the students' disruptive behavior was maintained by adult attention, we cannot be sure. Future research should further examine the role of the function of a student's behavior and response to the standard protocol CICO system.

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Limitations

In addition to the strengths of the current study, there are several limitations worth noting. While the use of a reversal design is clearly a strength, a limitation may be that the fifth-grade teacher implemented the intervention with two of her students simultaneously. We cannot assume that the behavior of the two participants was truly independent, and therefore a multiple baseline may have been a more appropriate design.

Another potential limitation is the moderately high variability observed across various phases and participants, especially for Fisher. The cause of variation cannot be attributed to any single variable, but it may be due in part to variation in classroom activities. Although observations were conducted during a consistent period of time for each participant (i.e., large group instruction or independent work), the actual tasks and activities varied across observation settings. For example, the level of task difficulty or task interest may have varied across sessions. Because the present study did not measure these variables explicitly, future research might include (a) controlling relevant contextual variables (e.g., only observe during tasks considered to be moderately difficult) or (b) observing and measuring potential relations between classroom activity variables and problem behavior or academic engagement.

Further, data regarding teacher interactions with participants was not recorded. It is possible that the classroom teachers' attention varied across observation sessions. Because these students' problematic behavior appeared to be sensitive to adult attention, it is possible that teacher attention during large group work for Jacob and independent work for Edwardo and Fisher may have impacted individual student behaviors. Future research should record data on teacher attention, as well as student problem behaviors and academic engagement.

Additionally, relatively low levels of problem behavior were observed across sessions, including baseline conditions. Although these levels limit the capacity for demonstrations of reductions in problem behavior between phases, these findings are typical when observing students receiving Tier 2 behavior interventions. Those students exhibiting severe or very frequent problem behaviors are often better matched with intensive, individualized interventions.

Another limitation of the current study is the small amount of data collected during the second CICO phase for all participants, especially Jacob. One reason for the relative brevity of this phase for Jacob and Edwardo is that their families moved suddenly, and they were no longer present in their respective classrooms. Beyond the practical impact of arbitrarily limiting the number of data points that could be collected, it is impossible to determine whether the act of moving or any variables leading up to the move had any effect on Jacob's or Edwardo's behaviors. Similarly, after the data presented in the current study were collected during the second CICO phase, Fisher

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moved to a different classroom because the current semester ended. To draw more robust conclusions, future studies might extend the second CICO phase to collect data over longer periods of time as well as to consider including an extended follow-up phase to assess maintenance of skills.

Practical Implications

The present study, in combination with other research on CICO, provides evidence for school practitioners to support implementation of CICO intervention systems as part of a continuum of positive behavior interventions. This investigation and evaluation of CICO is consistent with Anderson and Borgmeier's (2010) essential features for effective and efficient Tier 2 interventions. More specifically, it provides additional evidence that the standard protocol version of CICO may be effective for students whose problem behavior is maintained by attention.

Furthermore, this study provides documentation that teachers and other school personnel (e.g., school counselor) can successfully implement a standardized, systematic version of CICO with appropriate fidelity to reduce disruptive behavior and increase academic engagement. One important feature of the present study was that general education teachers and a school-based CICO coordinator implemented CICO with high levels of fidelity with minimal researcher assistance. Although educators may be tempted to individualize components of CICO (e.g., individualized behavior expectations, variable number of check-ins, variable number of points) rather than remain consistent across the school, these changes limit efficiency and may impact implementation fidelity. Future studies could elucidate the differences in fidelity of implementation and the efficacy of outcomes between standardized and individually tailored Tier 2 interventions.

Consistent with previous research (Hawken & Horner, 2003; Todd, Campbell, Meyer, & Horner, 2008), it appears that CICO is an efficient Tier 2 intervention. The amount of time it took to implement was minimal and teachers did not express concerns over feasibility. In addition, although the coordinator in the present study was a school counselor, other school personnel may have served in the role as well. For example, instructional assistants have been shown to be effective CICO coordinators (Crone, et al., 2010).

In summary, CICO implementation was functionally related to a reduction in disruptive behavior for all three participants. Similarly, a moderately strong functional relation was established between CICO and increases in academic engagement for two of the participants. Future research may serve to further establish standard CICO as an effective Tier 2 intervention for reducing problem behavior and increasing academic engagement in school settings. In addition, as academic engagement and disruptive behaviors are clearly not independent constructs, further research on the relationship and interactions between the two is warranted.

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