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Response to Intervention: Examining Classroom Behavior Support in Second Grade

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ABSTRACT: *This article reports on 2 studies investigating a response-to-intervention (RTI) approach to behavior support in 2 second-grade classrooms. The results suggest that a slightly more intensive but efficient targeted intervention ("check in and check out") was effective in supporting the social behavior success of 4 students whose problem behaviors were unresponsive to general classroom management practices. For 4 other students whose problem behaviors continued to be unresponsive to the "check-in and check-out" intervention, more individualized and function-based interventions were indicated and proved to be effective. The results from this research suggest that RTI logic can be applied to the social behavior support of students who present interfering problem behaviors in the classroom. Implications and recommendations for research and practice are discussed.*

Schools are increasingly held accountable for their efforts to improve the academic and social behavior of their students, despite diminishing resources to support those efforts (Eber, Sugai, Smith, & Scott, 2002; Sugai et al., 2000). In addition, many schools lack the expertise to define and use practices and systems that meet the needs of their students with both efficiency and effectiveness (Sugai et al., 2000; U.S. General Accounting Office, 2001). Further, with the advent of legislation requiring more proactive strategies to identify and serve students with academic and social behavior concerns, schools may be unprepared and ill-advised as to how to best implement such practices.

RESPONSE TO INTERVENTION

Language in the Individuals With Disabilities Education Improvement Act of 2004 (IDEA) about special education eligibility and assessment proce-

dures indicates that a local education agency "may use a process that determines if the child responds to scientific, research-based intervention as a part of the evaluation procedures" (Pub. L. No. 108-446 § 614, 118 Stat. 2706, 2004). This statement represents a considerable departure and alternative to the traditional IQ achievement discrepancy model used to determine special education eligibility under the learning disabilities (LD) category. The IQ achievement discrepancy model has been criticized for both its lack of treatment utility (Gresham et al., 2005) and inability to accurately differentiate low achieving students from students with learning disabilities (Fletcher et al., 1998). The response-to-intervention (RTI) process, in contrast, incorporates low-inference and functional assessment procedures that can link directly to group and individual intervention planning (Christ, Burns, & Ysseldyke, 2005).

RTI models typically are composed of a minimum of the following components: (a) a continuum of evidence-based services available to all students, from universal interventions and procedures to highly intensive and individualized interventions (Marston, Muyskens, Lau, & Canter, 2003); (b) decision points to determine if students are performing significantly below the level of their peers in academic (Vaughn, Linan-Thompson, & Hickman, 2003) and social behavior domains; (c) ongoing monitoring of student progress (Gresham, et al., 2005); (d) employment of more intensive or different interventions when students do not improve in response to other interventions; and (e) evaluation for special education services if students do not respond to intervention instruction (Fuchs, Mock, Morgan, & Young, 2003).

Traditionally, RTI has focused on academic concerns as a means to identify students under the LD category for special education services (Gresham et al., 2005). Research, generally, has evaluated either universal and/or targeted group interventions, often referred to as RTI-Standard Protocol (SP; Fuchs et al., 2003) or evaluated tertiary level individualized intervention, sometimes referred to as RTI-Problem Analysis (PA; Christ et al., 2005). Research evaluating components of either RTI-SP or RTI-PA has been conducted with elementary students with reading problems (Daly, Martens, Hamler, Dool, & Eckert, 1999; Vaughn et al., 2003). In addition, multicomponent and multiple baseline research designs and the conceptual logic of applying interventions of increasing intensity, as indicated by the needs of the student, have been used effectively to identify the most appropriate tertiary level academic or social behavior interventions for children (Barnett, Daly, Jones, & Lentz, 2004).

A SOCIAL BEHAVIOR RTI MODEL

RTI logic has intuitive appeal as a means to serve and identify students with emotional and/or behavior disorders. Despite the lack of specific empirical support for RTI in the social behavior domain, similar models of behavior support have been implemented in schools. Such models have been based on principles of wraparound behavior support (Eber et al., 2002) and/or the inclusion and integration of graduated systems of behavior support (Sugai et al., 2000). A social behavior model of RTI promises to be an extension and new application of the already substantial research base regarding positive behavioral interventions, functional behavior assessment (FBA), and early intervention (Sugai et al., 2000; Vaughn et al., 2003).

Universal Intervention

Applying RTI logic to social behavior support could require a standard-protocol approach for universal and targeted group level interventions (sometimes referred to as Tier 1 and Tier 2 interventions). The universal system, implemented schoolwide for all students, might require schools to identify and explicitly teach schoolwide expectations; implement a system to acknowledge expectation-compliant behavior; define and consistently apply consequences for inappropriate behavior; and regularly review progress towards schoolwide goals. Such a universal system reflects the features of schoolwide positive behavior support (SW-PBS; Lewis & Sugai, 1999). Numerous studies indicate that teaching expectations across settings and providing incentives for appropriate behavior (within the SW-PBS framework) can effectively reduce student problem behavior (Kartub, Taylor-Green, March, & Horner, 2000; Lewis, Powers, Kelk, & Newcomer, 2002;

Metzler, Biglan, Rusby, & Sprague, 2001; Safran & Oswald, 2003).

Employing evidence-based classroom management strategies may also serve as a universal level preventative intervention. For example, consistently implementing an acknowledgment system to recognize appropriate behavior in class, providing multiple and varied opportunities for students to respond during instruction, minimizing transition time between classroom activities, and providing direct and immediate corrective feedback for social or academic behavior errors may provide an excellent universal level foundation from which to identify students who may require more specific intervention supports.

Targeted Intervention

Students who do not respond as expected to the universal level or Tier 1 intervention may receive targeted or Tier 2 interventions. Tier 2 interventions typically provide targeted instruction focusing on the development of specific skills for a group of individuals engaging in similar error patterns. For example, students who are accurate but slow readers might receive a targeted fluency-based intervention. Within a social behavior RTI logic, corollaries to such targeted reading interventions have been examined, for example, "check in and check out" (CICO) and behavior education program (BEP). The CICO intervention provides additional structure, prompts, instruction, feedback, and acknowledgment for students engaging in similar low-level social behavior errors (Filter et al., in press; Hawken & Horner, 2003; Todd, Kauffman, Meyer, & Horner, in press). There are numerous variations of CICO interventions, such as Daily Behavior Report Cards (Chafouleas, McDougal, Riley-Tillman, Panahon, & Hilt, 2005), but what is generally consistent across most variations is the efficiency with which an intervention can be implemented and its application to groups of students. Incorporating a targeted social behavior intervention into a social behavior RTI logic also fits seamlessly within the SW-PBS framework.

Individualized Intervention

Students who are unsuccessful in response to a targeted intervention may experience Tier 3 or RTI-problem analysis (Christ et al., 2005), specific and time-intensive assessments to determine individual skill deficits and to assist in the design of an individual intervention. Depending on a variety of factors, evaluation for special education eligibility may also ensue. Functional behavior assessment (FBA) might be deemed comparable to a Tier 3 assessment for reading. FBA is a process used to determine events that reliably predict and maintain behaviors of concern (Horner, 1994; Sugai, Lewis-Palmer, & Hagan, 1998). The process is a widely supported assessment procedure specifically mentioned in IDEA, used to inform behavioral intervention, and theoretically anchored to applied behavior analysis and PBS (Sugai et al., 2000). FBAs require collecting and analyzing various forms of indirect, descriptive, and experimental assessments to deduce a plausible hypothesis which can be tested and which identifies the likely conditions under which behaviors of concern occur.

The FBA is of little value by itself, unless it is used to inform an intervention plan. Because it is used to design a function-based intervention, the FBA-based hypothesis statement—which includes both desired behaviors and acceptable alternative behaviors or benchmarks toward desired behaviors—is usually stated clearly within the plan. The majority of the function-based behavior intervention plan is then devoted to outlining strategies to (a) change antecedent conditions likely to precede problem behavior, (b) teach prosocial behaviors effective in accessing the same consequences as problem behaviors, (c) decrease access to desired consequences following problem behavior, and (d) increase access to desired consequences following appropriate behavior (Crone & Horner, 2003). The plan also includes implementation tasks, decision rules to modify implementation, and demographic information.

The FBA is of little value by itself, unless it is used to inform an intervention plan.

Function-based support—the practice of linking FBA information to the design and implementation of behavior intervention plans—has resulted in positive outcomes for individuals with

developmental and intellectual disabilities (Carr, 1977; Iwata, Dorsey, Slifer, Bauman, & Richman, 1982) and individuals with emotional and behavior disorders (Lewis & Sugai, 1993; Vollmer & Northup, 1996).

RTI activities fit easily within SW-PBS's three-tiered prevention logic (Sugai et al., 2000). RTI represents a process that facilitates access to appropriate levels of both academic and social behavior intervention support. Although intensifying levels of behavior support can be defined, the dependent measures and decision rules schools use to identify "low responders" to social behavior interventions are not as well established. Furthermore, eligibility for special education services and more intensive, wraparound behavior support services must also be considered (Eber et al., 2002; Epstein et al., 2005).

RESEARCH QUESTIONS

Study 1 evaluated a CICO targeted intervention designed with minimal researcher consultation and implemented by two second-grade teachers for 10 students. Study 2 consisted of an experimental evaluation of the effects of individualized function-based support for 4 participants whose behaviors did not respond as expected to the CICO intervention. Study 2 interventions were developed collaboratively by school personnel and researchers and were implemented by one second-grade teacher. The current study addresses two overarching research questions:

Study 1: Does a relationship exist between implementation of a CICO targeted intervention and (a) percentage of intervals participants were observed to be engaged in problem behavior, (b) frequency of office discipline referrals, and (c) teacher perceptions of problem behavior intensity and frequency?

Study 2: Does a functional relationship exist between implementing function-based behavior intervention plans and reductions in (a) percentage of intervals participants were observed to be engaged in problem behavior, (b) frequency of office discipline referrals, and (c) teacher perceptions of problem behavior intensity and frequency?

STUDY 1: METHOD

Setting

The study took place at a public elementary school within a suburban school district serving approximately 5,500 students in a small city in the northwestern United States. The elementary school was implementing SW-PBS (Sugai et al., 2000) effectively (100% of components) based on scores obtained from the School-wide Evaluation Tool (SET), a reliable and valid assessment tool measuring PBS implementation accuracy and fidelity (Horner et al., 2004).

Participants

The principal and second-grade teachers at the school contacted researchers because of concerns related to increasing numbers of office discipline referrals and overall disruptive behavior in their two classrooms. The principal, two second-grade teachers, and the counselor met with researchers and discussed concerns and possible solutions to the reported increases in problem behavior in their classrooms. The teachers then nominated students in each classroom to take part in the study. Parents of the participants were sent letters of consent regarding the study and their child's potential involvement in the study. Students also provided their assent to be involved in the study.

Ten children between the ages of 7 and 8 participated in the study. All participants received instruction in a general education setting in one of two second-grade classrooms. Table 1 provides a summary of student characteristics (pseudonyms used) and their Dynamic Indicators of Basic Early Literacy Skills Oral Reading Fluency (DIBELS ORF; Good & Kaminski, 2002) measures in fall and spring. All the participants are described as one group across the two classrooms because both teachers worked collaboratively and observation and intervention procedures were the same. Another male initially participated in the study but moved away during the beginning of the study; his data are not included. Helena also moved out of the school neighborhood toward the end of the study, and her data are included. Farrell and Marcellus were receiving behavioral interventions at the time of the study's implementation. Six of 10 participants met DIBELS standard benchmarks

TABLE 1

Participant Demographic Information

Participants	*Gender*	*Ethnicity*	*Medication*	*Special Education Eligibility*	*DIBELS ORF Scores (wrc)*	
					Fall	*Spring*
Classroom A						
Chase	Male	Caucasian	Concerta	No	27	79
Randy	Male	Caucasian	No	No	52	100
Isabel	Female	Native American	No	No	9	30 (Jan.)
Classroom B						
Helena	Female	Caucasian	No	No	49	80 (Jan.)
Jade	Female	Caucasian	No	LD	29	59
Farrell	Male	African American	Adderall	No	65	158
Marcellus	Male	Caucasian	No	No	81	103
Blair	Female	Caucasian	No	No	80	110
Ben	Male	Caucasian	No	No	74	116
Olivia	Female	Caucasian	No	LD	18	60

Note. DIBELS ORF = Dynamic Indicators of Basic Early Literacy Skills Oral Reading Fluency; wrc = words read correctly per min; LD = learning disability.

for fall (i.e., 44 words read correctly = low risk) and 5 of 8 participants (2 participants had moved) met benchmarks for spring (i.e., 90 words read correctly = low risk).

Due to classroom and parental factors, Chase and Isabel received only the CICO intervention, even though the two were considered candidates for function-based behavior support. Chase and Isabel's data provide an indirect peer comparison between participants who successfully responded to CICO and participants who were not responsive to CICO, but were responsive to function-based behavior support.

During each observation, two randomly chosen peers (who served as composite peers) were also observed to gauge typical problem behavior levels in the classroom beyond primary participants and to discern what acceptable levels of problem behavior in the classroom were. One indicator of participants' responsiveness to interventions was how their data compared to composite peer data.

Design

A descriptive quasi-experimental design was used to study CICO implementation and effectiveness. Time-series data were collected on each student across five phases: baseline, CICO 70%, CICO 75%, CICO 80%, and CICO 90% of points. These phases represent an increase in the percentage of points required of students on the CICO plan to earn a classroom reward. For example, in the 70% phase student participants had to earn 70% of possible points to earn the classroom reward. Because CICO is presented and managed as a group-contingency intervention, all students received the intervention at the same time, preventing staggered implementation across students.

Measurement

Primary Dependent Variables. The observational dependent variables for the study were percentage of intervals engaged in (a) inappropriate physical contact, (b) talk-outs, (c) inappropriate placement, (d) noncompliance, (e) nondisruptive off-task behavior, and (f) academic engagement. With the exception of academic engagement, all of the behaviors were used as an index of overall problem behavior. In other words, an interval was reported as a *problem behavior interval* if one or more of the problem behaviors occurred during an interval; otherwise the participant was consid-

ered academically engaged. The nondisruptive off-task code assisted data collectors in differentiating participants who were not engaged in obvious overt problem behavior, but who were oriented away from the task at hand, from participants who were academically engaged. Only problem behavior (a composite of all the problem behavior codes) is reported in the results section.

Inappropriate physical contact was separated into three categories and was defined as any voluntary action, attempted or actual behavior that (a) could cause injury to oneself or another individual (physical assault), (b) could cause damage to an object and was not in compliance with teacher directions (inappropriate physical contact with an object), (c) or involved physical contact with another person and was not in compliance with teacher directions (inappropriate physical contact with a peer). *Talk-outs* were defined as any verbal utterance that interrupted teacher or student directions, comments, or questions without the student being called on or asked a question directly. Talk-outs could be directed towards a peer(s), a teacher, or oneself. *Inappropriate placement* was defined as losing contact with the seat surface, all four legs of a chair off the floor, or standing when expected to sit. *Noncompliance* was defined as not following classroom rules or expectations or doing something other than complying with an adult's directive within 5 s. *Nondisruptive off-task behavior* was defined as being oriented away from the task at hand for more than 3 s of an interval. *Academic engagement* was defined as orientation toward the task at hand, compliance with all directions, and working with appropriate materials.

Observers additionally recorded context codes denoting concurrent activities within the classroom, including (a) teacher-led instruction (TLI), (b) independent seat work (ISW), (c) cooperating work group (CWG), (d) free-choice time (FCT), and (e) transition time (TT).

Data Collection. The first and third authors, who had extensive experience observing problem behavior, collected observational data. Initially, they spent time in the two classrooms identifying the most frequent and intensive occurring problem behaviors and testing different observation systems. Then, operational definitions of behaviors of interest and an observation system were developed and practiced. Together, the observers reviewed operational definitions and conducted observations to ensure initial observations were reliable. The observers also frequently consulted with the second and fourth authors to clarify and improve the consistency of definitions and observation procedures across both classrooms.

The primary observational dependent variables were measured using a 10-s partial interval recording system for 40-min observations. All participants in the CICO program and two randomly selected peers were observed for 1-min increments. Before conducting an observation, observers selected a code to correspond to each participant. The corresponding participant would be observed for 1 min every time the preselected code occurred. Digital voice recorders with single earphones were used to cue observers for the beginning of intervals. Each classroom was observed 2 to 4 times a week, at times during which the teacher had indicated problem behavior to be most intense and frequent.

Observer Agreement for Primary Dependent Variables. Interobserver agreement data were collected during approximately 25% of observations and at least once per phase. The primary observer was the individual who regularly observed in the classroom. Agreement was determined by comparing each interval of the primary and secondary observers' data sheets. Two intervals were considered in agreement if, and only if, the same problem behaviors or academic engagement were marked by both observers. The percentage of total agreement was calculated by dividing the total number of agreements by the total number of agreements plus disagreements multiplied by 100%. Interobserver agreement averaged 90% (range, 76%–100%).

Secondary Dependent Variables. To evaluate the teacher's perception of the participant's behavior, a 5-point, 5-item rating scale was developed based on the context and specific interventions that were implemented. The rating scale was administered once before, twice during, and once after the study's implementation. The classroom teacher was asked to rate the (a) overall intensity and frequency of problem behavior in the classroom (2 items), (b) intensity and frequency of the problem behavior of participants in the CICO program (1 item), and (c) extent to which the

FIGURE 1

Sample Check-In and Check-Out Card

POINT SHEET

Name _____

Date _____

Rating Scale
2 = Great
1 = OK
0 = Goal not met

Points Possible _____
Points Received _____
Percentage of Points _____
Goal Met? Y N

GOALS:	8:30-9:30	9:30-10:30	10:30-11:30	11:30-12:30	12:30-1:30	1:30-2:30
1. RESPECT OTHERS	2 1 0	2 1 0	2 1 0	2 1 0	2 1 0	2 1 0
2. MANAGE SELF	2 1 0	2 1 0	2 1 0	2 1 0	2 1 0	2 1 0
3. SOLVE PROBLEMS RESPONSIBLY	2 1 0	2 1 0	2 1 0	2 1 0	2 1 0	2 1 0

CICO program was considered to reduce problem behavior of student participants and their peers in the classroom (2 items). When the rating scale was administered before the intervention was implemented, items addressed the teacher's confidence that CICO would positively impact student behavior.

Office discipline referral information was analyzed before, during, and after the study's implementation. Based on the school's procedures and policies, office discipline referrals were categorized as major or minor behavior violations. Major behavior violations were given for abusive language, fighting, harassment, and defiance. Minor behavior violations were given for disruption, property misuse, inappropriate language, and noncompliance.

PROCEDURES

Baseline: SW-PBS and Classroom Management. In the second-grade classrooms, SW-PBS was linked to the schoolwide system by acknowledging appropriate behavior using the schoolwide positive behavior "respect" tickets, teaching and referring frequently to schoolwide expectations, and providing predictable consequences for rule infractions. The PBS system was maintained through all phases of the study. Six observations were conducted during baseline. Office discipline referral data were collected throughout the study and teacher perception ratings were collected once during baseline.

Check-In and Check-Out Intervention. A targeted CICO group intervention was designed and implemented by the two second-grade classroom teachers. Based on Hawken and Horner's (2003) guidelines, the CICO program provided students with (a) increased structure and prompts, (b) additional instruction on specific skills, and (c) increased regular feedback. The researchers and other teachers who had experience with implementing CICO interventions provided the second-grade teachers with suggestions about critical features and implementation guidelines.

The CICO cards (see Figure 1) were the same for all participants and restated schoolwide rules as individual "goals" ("respects others," "manages self," and "solves problems responsibly"). Students had the opportunity to receive 36 points throughout a school day based on their behavior during six discrete 60-min time periods. Teachers rated each participant's behavior at the end of each designated time period (0 = goal not met, 1 = okay, and 2 = great). Students were also given feedback about their behavior, usually in the form of specific praise or corrective feedback. Participants carried their CICO card to all classes on a small clipboard.

Students with the CICO cards were identified as "leaders" and the rest of the students in the class were called "coaches." Coaches were asked to help the leaders stay on task and follow the schoolwide expectations. At the end of the day, each leader added up his or her points and shared the point total with the whole class. If the leaders' cumulative total points met or surpassed a specified percentage of the total points possible (range, 70%–90%), the class earned a reward such as a class game, free choice time, an extra recess, or a piece of candy. At the beginning of the CICO implementation, leaders were required to earn 70% of possible points. Over the duration of the study the criterion was increased to 75%, 80%, and 90% of points. Teachers decided when to increase the percentage of points required to earn the class reward. When leaders met criteria consistently (e.g., 5–6 days in a row), teachers raised the criteria.

Participants in Classroom A were observed on approximately 31 occasions (unless they were absent) during CICO phases. During CICO phases, in Classroom B, participants receiving function-based support were observed 21 times and participants receiving CICO throughout the study were observed 57 times. Ben, who entered the study late, was observed on 8 occasions during CICO phases. The first CICO phase lasted 1 week, the second phase lasted approximately 8.5 weeks (including winter break), the third phase lasted 2 weeks, and the fourth phase lasted until the end of the study or 16 weeks.

Fidelity of Implementation. Approximately once a week at different points throughout the day, the school counselor would visit each classroom to assess the accuracy of the CICO implementation. A fidelity checklist was developed so that each of the nine critical activities of the CICO program could be checked as occurring, not occurring, or unclear. To calculate the percentage for implementation fidelity, the number of components that were implemented was divided by the number of components implemented plus the number of components not implemented, and multiplied by 100%. The components that the school counselor identified as *unclear* were not included in the fidelity calculation because it generally meant that the counselor was not present to observe whether an activity occurred during a specified time period.

Fidelity data were collected on 8 occasions for Classroom A participants (Chase, Randy, Isabel); on average, the CICO program was implemented with 88% accuracy (range, 50%–100%). Fidelity data were collected on 14 days for Classroom B participants (Helena, Jade, Farrell, Marcellus, Blair, Ben, Olivia); on average, the CICO program was implemented with 94% fidelity (range, 82%–100%).

Analysis

To evaluate the effects of the CICO intervention, researchers conducted visual analyses of graphed data and considered variability, trends (see Figure 2), average rates of responding, immediacy of effect, composite peer data, and overlap of data points within and across phases. Visual analysis criteria were based on the guidelines of Horner et al. (2005) and Parsonson and Baer (1986). Participant behavior was considered responsive to intervention if observable, sustained, and socially valid reductions in problem behavior were observed, especially in relation to problem behavior rates of composite peers.

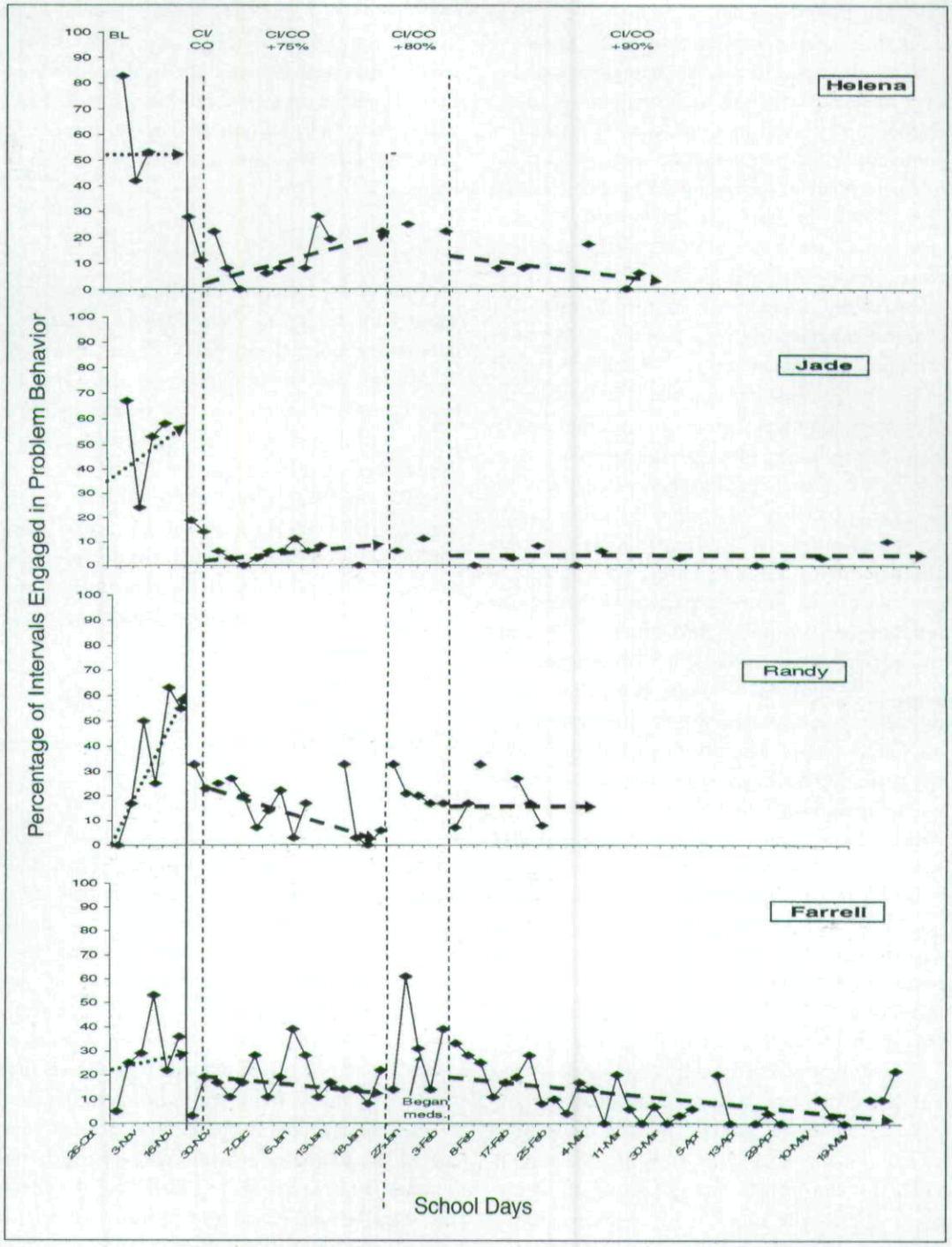
STUDY 2: METHOD

Participants and Setting

Based on direct observation data and teacher and counselor nomination, four students (Blair, Ben, Marcellus, and Olivia) in Classroom B were identified as having behaviors unresponsive to the CICO intervention and requiring more individualized intervention. "Unresponsiveness" was defined as (a) little change in overall rates of problem behavior, (b) increasing trends in rates of problem behavior, and/or (c) continuation of serious disruptive problem behavior. The second-grade teacher in Classroom B and school counselor completed the Functional Assessment Checklist for Teachers and Staff (FACTS; March et. al, 2000), and identified individual student strengths, behaviors of concern, routines in which problem behaviors were likely to occur, and conditions in which the behavior of concern were likely to occur (i.e., setting events, antecedents, and consequences). After completing the FACTS, the second-grade teachers, school counselor, other school personnel

FIGURE 2

Percentage of Intervals Engaged in Problem Behavior: CICO Responders



with whom the participant had contact, and one of the researchers developed a function-based individualized behavior support plan. The researchers also provided summaries of some observational data and minimal consultation.

Each behavior support plan included information about (a) student strengths, (b) behavior of interest, (c) setting events and antecedents, (d) perceived maintaining consequences, (e) alternative behaviors, and (f) desired behaviors (see

TABLE 2

Problem Behavior Contingencies Across Students

Student	*Setting Events*	*Antecedents*	*Behaviors of Interest*	*Consequence*
Marcellus	N/A	(a) Easy unstructured activities	(a) Out of seat and making faces	(a) Peer attention
		(b) Difficult math and writing tasks	(b) Talk-outs, out of seat, poor work completion	(b) Escape work
Blair	N/A	Independent work time	Out of seat and talking to peers	Peer and adult attention
Ben	N/A	Teacher-led instruction Teacher direction	Noncompliance, talk-outs, making jokes	Peer and adult attention
Olivia	Thinking about the loss of her sibling	Teacher-led instruction	Playing with things, looking away from the teacher, not following directions	Adult attention

Tables 2 and 3). Alternative behaviors were selected that (a) were acceptable in the teacher's classroom, (b) would allow the participant acceptable access to the same consequence as the problem behavior, and (c) were comparable to the problem behavior with respect to effort and efficiency. The selection of the desired behavior was based on the teacher's expectations for other students. Behavior support plans included intervention and instructional strategies designed to consider the influence of setting events, antecedents, and maintaining consequences, and detailed teaching and strengthening reinforcing consequences for alternative and desired behaviors. Additionally, the plan outlined implementation tasks, data collection methods, long- and short-term goals, and criteria for intervention decision making.

Design

Observers collected time-series data on each student across five or six phases: (a) baseline, (b) CICO 70%, (c) CICO 75%, (d) CICO 80%, (e) FBA-based plan, and (f) FBA-based plan–adjusted. The participants in this study did not experience the 90% phase. Participants continued at the 80% phase until their FBA plan was implemented. Function-based plan implementation was staggered, and a multiple baseline design across four participants was used to examine the effectiveness of function-based plans.

Measurement

Primary Dependent Variables. The observational dependent variables were percentage of intervals engaged in (a) inappropriate physical contact, (b) talk-outs, (c) inappropriate placement, (d) noncompliance, (e) nondisruptive off-task behavior, and (f) academic engagement. Definitions were identical to those provided in Study 1.

Procedures

Data collectors from Study 1 used the same observation forms and procedures with a few exceptions. A 10-s partial interval recording system was used for 30-min observation sessions, conducted 3 to 4 times a week. All students receiving function-based support and a peer were observed during every observation. Each student who continued to receive CICO but was not receiving function-based support was observed approximately every third observation.

TABLE 3

Individualized Function-Based Intervention Components by Participant

Student	*Setting Events*	*Antecedents*	*Behaviors of Interest*	*Consequence*
Marcellus	N/A	*Change seating* Sit by peer of choice *Check-in/out* Continue basic program already in place *Modify amount and/or difficulty of work* Can choose to do less work and take remaining work home to do with Mom *Precorrections* Remind Marcellus of (a) choices at beginning of math, (b) peer selection, and (c) options at the end of math	*Teach/review expectations* Teacher to review choice making for math, peer, and end-of-period activity	*Response to desired behavior* 1. Teacher to provide at least 1 praise statement per 10 min Privilege/responsibility: 2. End-of-period activity choice option (e.g., computer time) 3. Usual check in/out at end of day (goal: 80% of points) 4. At end of day, teacher reminds Marcellus of what and how much work needs to be completed at home *Response to problem behavior* 1. Point loss 2. Reminder to return to seat 3. Return to own seat away from peer
Blair	N/A	*Check-in/out (attach summary & point sheet)* Basic classroom plan. Modify classroom point sheet to include under "Manage Self": 1. Staying in seat 2. Talking only when it is okay 3. Following directions the first time	*Teach/review expectations* 1. Counselor will review with Blair the expectation that she follow directions the first time given 2. If Blair does not follow directions teacher will say, "Blair, I gave you a direction and you didn't do as I asked, you need to put your head down." After 10 s, teacher will follow up with a second request to do as earlier instructed 3. If Blair still does not do as instructed she will get a check on her point sheet for self management 4. Teach specific social skills/scripts (See above)	*Response to desired behavior* 1. Verbal praise Privilege/responsibility: 2. Blair earns recess and reward time at end of day by making her points 3. Usual check in/out with class at end of day (goal: 80% of points) *Response to problem behavior* 1. Point loss: Points are totaled before lunch and again at the end of the day. Blair needs to earn 14/18 points to have morning recess or participate in end-of-day class reward

continues

TABLE 3 *(Continued)*

Student	*Setting Events*	*Antecedents*	*Behaviors of Interest*	*Consequence*
Ben	N/A	*Check-in/out (attach summary & point sheet)* Basic classroom plan. Modify classroom point sheet to include under "Manage Self": 1. Staying in seat 2. Talking only when it is okay 3. Following directions the first time	*Teach/review expectations* 1. Counselor will review with Ben the expectation that he follow directions the first time given. 2. If Ben does not follow directions, teacher will say, "Ben, I gave you a direction and you didn't do as I asked, you need to put your head down." After 10 s, teacher will follow up with a second request to do as earlier instructed. 3. If Ben still does not do as instructed he will get a check on his point sheet for self-management 4. Teach specific social skills/scripts (See above)	*Response to desired behavior* 1. Verbal praise Privilege/responsibility: 2. Ben earns his recess and reward time at the end of the day by making his points 3. Usual check in/out with the class at end of day (goal: 80% of points) *Response to problem behavior* 1. Point loss: Points are totaled before lunch and again at the end of the day. Ben needs to make 14/18 pts to have morning recess or participate in end-of-day class reward
Olivia	Grief therapy group	*Change seating* Increase adult proximity *Check-in/out (attach summary & point sheet)* Basic classroom plan. Modify classroom point sheet to include under "Respect Others": 1. Say nice things or no things 2. Look at the teacher during instruction 3. Be a good listener 4. Have empty hands	*Teach/review expectations* Counselor will review expectations for respecting others: 1. Say nice things or no things 2. Look at the teacher during instruction 3. Be a good listener 4. Have empty hands	*Response to desired behavior* 1. Verbal praise 2. Usual check in/out with the class at end of day (goal: 80% of points) 3. Color spots for being respectful to the teacher on a spot card. 4. When Olivia's spot card is full she can choose to: – Have lunch in the room with the teacher – Color with the counselor – Take a friend to the counselor's office to play – Get a treat from the principal or counselor *Response to problem behavior* 1. Lose points on point sheet 2. Does not participate in class reward if 80% of points are not earned

Observer Agreement for Primary Dependent Variables. As in Study 1, interobserver agreement data were collected and summarized for approximately 25% of observation sessions. Interobserver agreement averaged 91% (range, 85%–100%).

Baseline and CICO. Marcellus, Blair, and Olivia received the same baseline and CICO conditions described in Study 1. Olivia was observed more sporadically because she was not initially considered for function-based support. Ben entered the classroom late and became involved in the study during the 80% CICO phase.

Participants were observed between 19 and 35 times during the function-based behavior support phases; differences in observation numbers are due to the staggering of intervention implementation. The function-based behavior support phase lasted 16 weeks for the first participant. Variations in length of the function-based behavior support phase are also due to the staggering of intervention implementation for different participants.

Fidelity of Implementation. To examine the extent to which function-based support plans were accurately implemented, researchers developed individualized fidelity checklists that reflected components for each student's behavior support plan. During regularly scheduled observations, observers would check whether each element occurred, did not occur, occurred intermittently or partially, or would not necessarily occur (depending on the time of the observation). On average, Marcellus's plan was implemented with 84% fidelity (range, 67%–100%), Blair's plan was implemented with 76% fidelity (range, 60%–100%), Ben's plan was implemented with 82% fidelity (range, 60%–100%), and Olivia's plan was implemented with 81% fidelity (range, 80%–83%). Across students, fidelity of implementation averaged 80.75%. To examine the accuracy of these fidelity checks, a second observer completed the same checklist during 28% of Marcellus's observations, 31% of Blair's observations, 50% of Ben's observations, and 100% of Olivia's observations. Agreement or the number of agreements divided by the number of disagreements plus agreements, multiplied by 100% was averaged at 92% (range, 87%–100%).

ANALYSIS

Researchers applied the same visual analysis procedures used in Study 1, and examined variability, trends (see Figure 3), average rates of responding, immediacy of effect, composite peer data, and overlap of data points within and across phases.

RESULTS

All 10 participating students experienced the CICO intervention. The problem behaviors of four of these students were responsive to CICO and did not require more intensive, tertiary level interventions. Of the 6 students whose behaviors were not responsive to CICO, 4 students received more individualized function-based interventions. Two students (Chase and Isabel) remained in the CICO condition and served as peer controls; their data (see Figure 4) provide an indirect peer comparison between participants who successfully responded to CICO and participants who were not responsive to CICO, but were responsive to function-based behavior support. The results for these groups of participants are described below.

CICO RESPONDERS

Ten students were nominated as needing more support than available through the general schoolwide and classroom management procedures, and CICO procedures were implemented. Observation data for 4 of these students indicated responsiveness to CICO (see Figure 2). A visual analysis of baseline data for Randy (mean intervals with problem behavior, 32% range, 0%–63%) and Farrell (mean intervals with problem behavior, 28% range, 5%–38%) revealed increasing levels of problem behavior, compared to composite peer comparisons (mean, 19% range, 6%–58%; see Figure 5). An analysis of baseline data for Helena (mean, 59% range, 42%–83%) and Jade (mean, 51% range, 24%–67%) indicated high levels of problem behavior. When CICO was initiated, the problem behaviors of each of these students were immediately decreased (level change and decelerating trends), and maintained at low rates. Mean intervals with problem behavior during CICO for Randy were 20% (range, 0%–33%), Farrell 18% (range, 0%–

FIGURE 3

Percentage of Intervals Engaged in Problem Behaviors: CICO Low Responders With Function-Based Supports

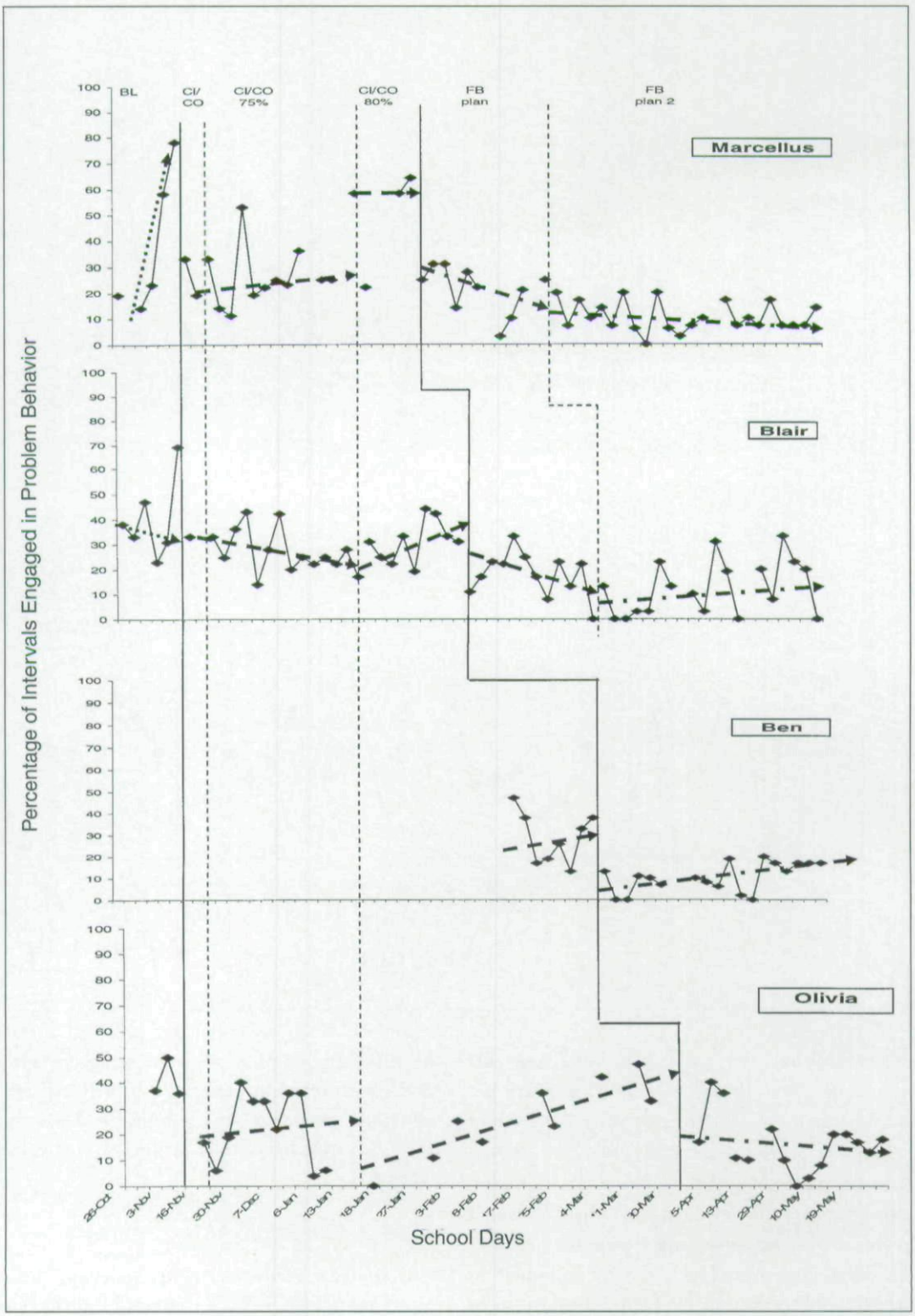
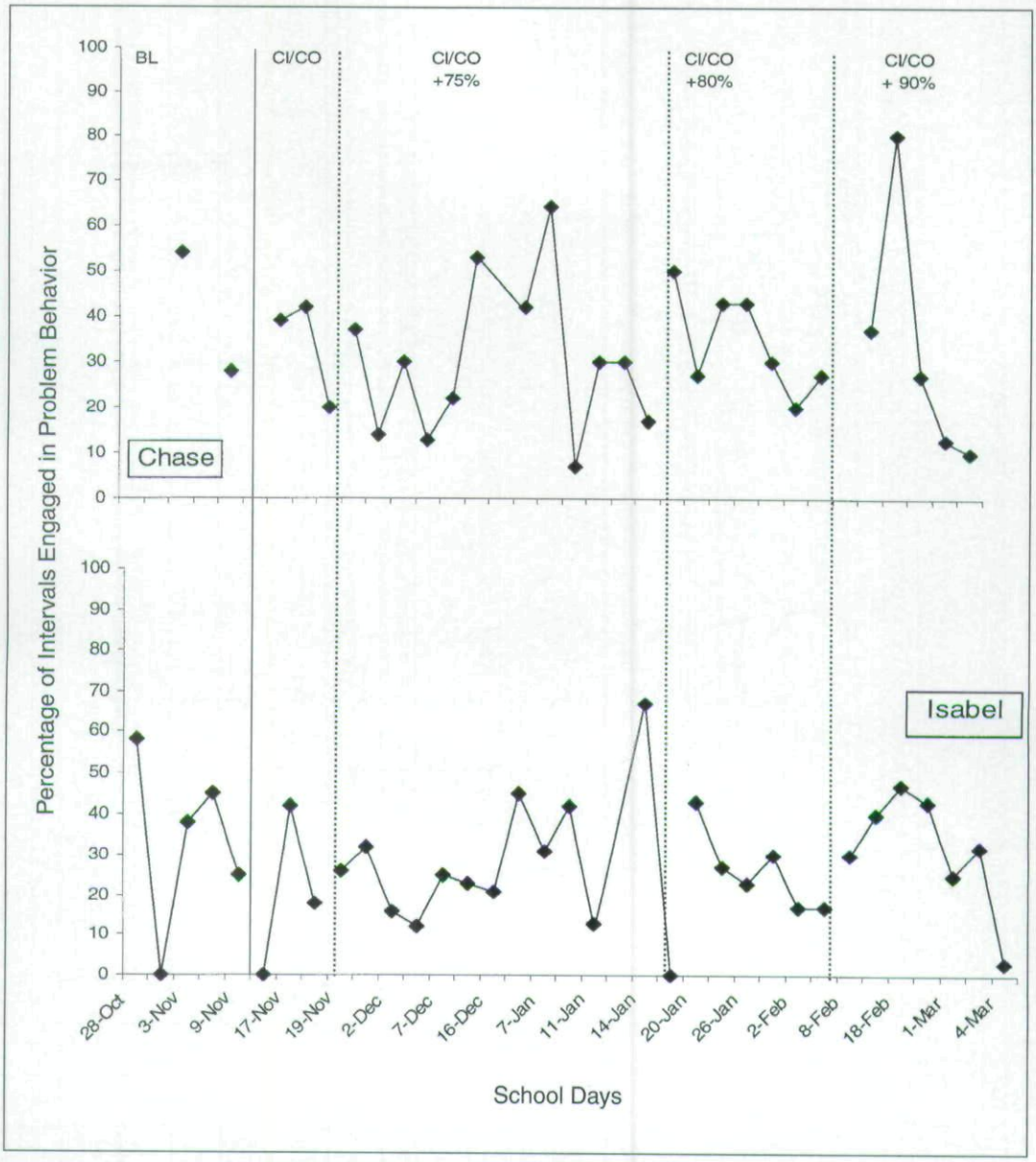


FIGURE 4

Percentage of Intervals Engaged in Problem Behavior: CICO Peer Controls



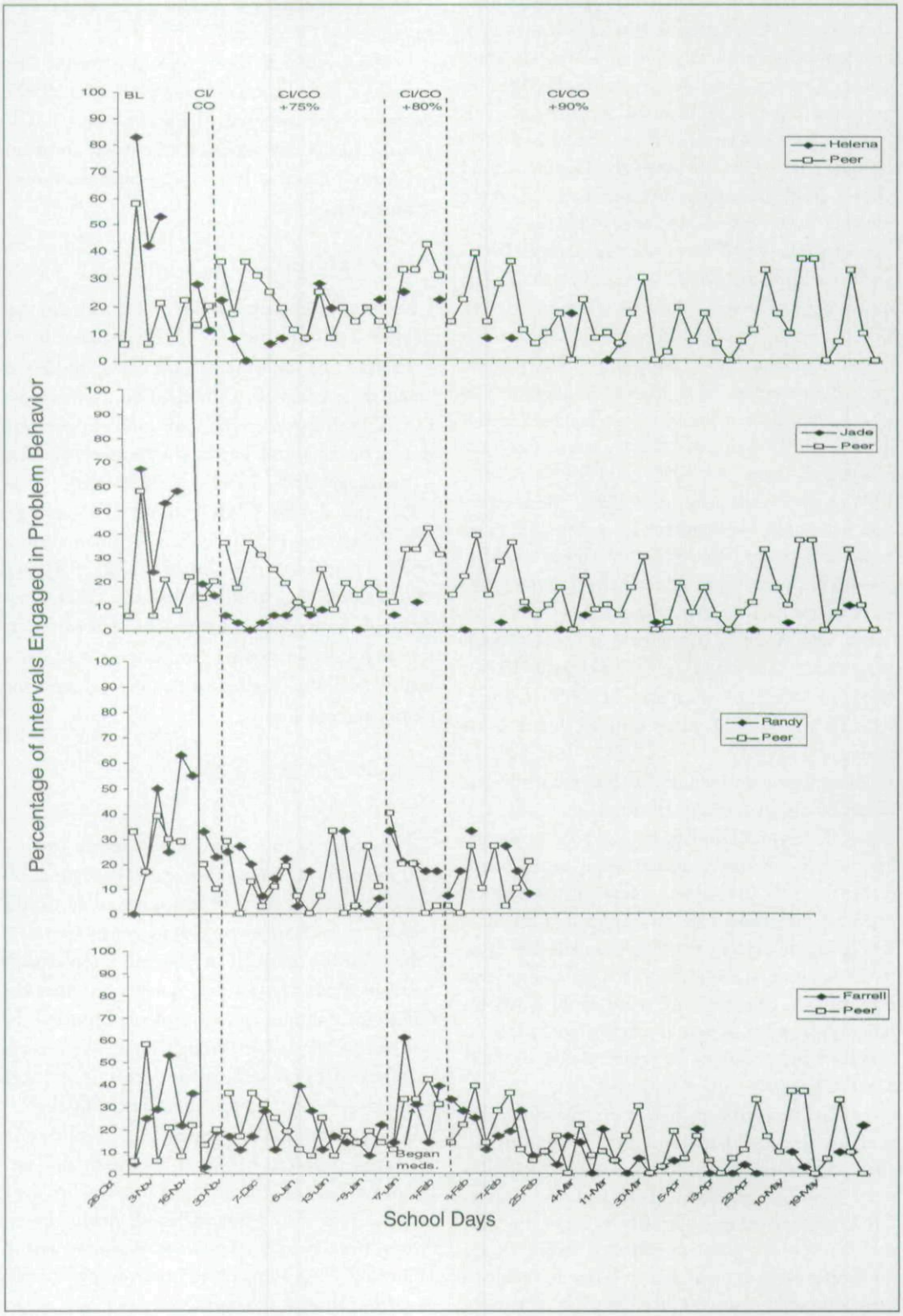
61%), Helena 14% (range, 0%–28%), and Jade 6% (range, 0%–19%). All rates of problem behavior during CICO phases were lower than composite peers (mean, 22% range, 8%–42%). Farrell's rates of problem behavior increased slightly during the 80% criterion phase, at which time he also began taking a new medication. However, rates of problem behavior continued to decrease in association with the introduction of the 90% criterion phase. In summary, average intervals with problem behavior were reduced not only from baseline to CICO phases for all participants, but were lower than composite peer comparisons.

CICO + Function-Based Support

Four students whose behaviors were not sufficiently responsive to CICO received individually

FIGURE 5

Percentage of Intervals Engaged in Problem Behaviors: Peer Composite and CICO Responders



developed and staggered function-based support (multiple baseline design; see Figure 3). Marcellus and Blair had similar patterns of responding across phases. Compared to baseline, their rates of problem behavior during CICO were undifferentiated. During baseline Marcellus engaged in problem behavior a mean of 38% of intervals (range, 19%–78%) and Blair a mean of 40% (range, 23%–69%) of intervals. During CICO phases, Marcellus engaged in problem behavior a mean of 34% of intervals (range, 11%–64%) and Blair a mean of 30% of intervals (range, 14%–40%). Within the CICO conditions, their rates of problem behaviors indicated increasing trends. When function-based interventions were introduced, immediate level changes and relatively flat trend lines were noted in rates of problem behavior. During the first function-based phase Marcellus engaged in problem behavior a mean of 21% of intervals (range, 6%–39%) and Blair a mean of 17% of intervals (range, 0%–33%). Mean intervals with problem behavior for composite peers were 21% (range, 3%–64%; see Figure 6). After acceptable rates of problem behavior were observed (similar to peers), the plans for both students were modified to increase self-management expectations. Intervals with problem behavior were reduced to a mean of 10% (range, 0%–25%) for Marcellus and 12% for Blair (range, 0%–39%).

Permission to include Ben in this study was obtained about halfway through the study. Because of previous displays of problem behaviors, his teacher and the counselor immediately introduced him to the CICO intervention, which proved to be unsuccessful in improving his behaviors (mean intervals with problem behavior equal to 29% range, 13%–47%). A level change was immediately observed and maintained when his function-based plan was implemented (mean intervals with problem behavior equal to 10% range, 0%–20%).

Olivia's problem behaviors initially responded to the CICO condition. Mean intervals with problem behavior during baseline for Olivia were 41% (range, 36%–50%) and 25% across CICO phases (range, 0%–40%). However, over time her rates of problem behavior increased, approaching rates comparable to baseline. When a function-based plan was introduced, a downward trend was indicated and relatively low rates maintained until the end of the school year (mean intervals with problem behavior equal to 16% range, 0%–47%).

Mean intervals with problem behavior were reduced during function-based phases for all participants as compared to baseline and CICO phases. Additionally, mean intervals with problem behavior were also lower than peer composite comparisons.

CICO Peer Controls

Classroom and parental circumstances did not provide opportunities for function-based interventions to be implemented for Chase and Isabel when their behaviors proved to be unresponsive to CICO. Mean intervals with problem behavior during baseline for Chase and Isabel were equal to 41% (range, 28%–54%) and 28% (range, 0%–58%) and during CICO phases, 37% (range, 7%–80%) and 20% (range, 3%–45%) respectively. Their data are included in Figure 4 as an indirect peer comparison. Across the CICO condition, Chase's rates of problem behavior were systematically increasing, and Isabel's rates were undifferentiated within and across neighboring phases and conditions.

Classroom Office Discipline Referrals

The number of office discipline referrals (majors and minors) was averaged to attain the rate of office discipline referrals per instructional day in the second-grade classrooms. During September, October, and the first half of November the average number of referrals per day equaled .85. After the CICO intervention was implemented (during the last half of November through June), the average number of office discipline referrals per day equaled .41 (see Figure 7). Additionally, before CICO intervention implementation, both teachers rated problem behavior intensity and frequency across all students as a 4 or higher on a scale of 1 to 5 (5 being *extremely intense* or *extremely frequent* and 1 *not intense* or *not frequent*). Following CICO implementation, teachers rated problem behavior as a 3 or lower.

FIGURE 6

Percentage of Intervals Engaged in Problem Behaviors: Peer Composite and Function-Based Intervention Participants

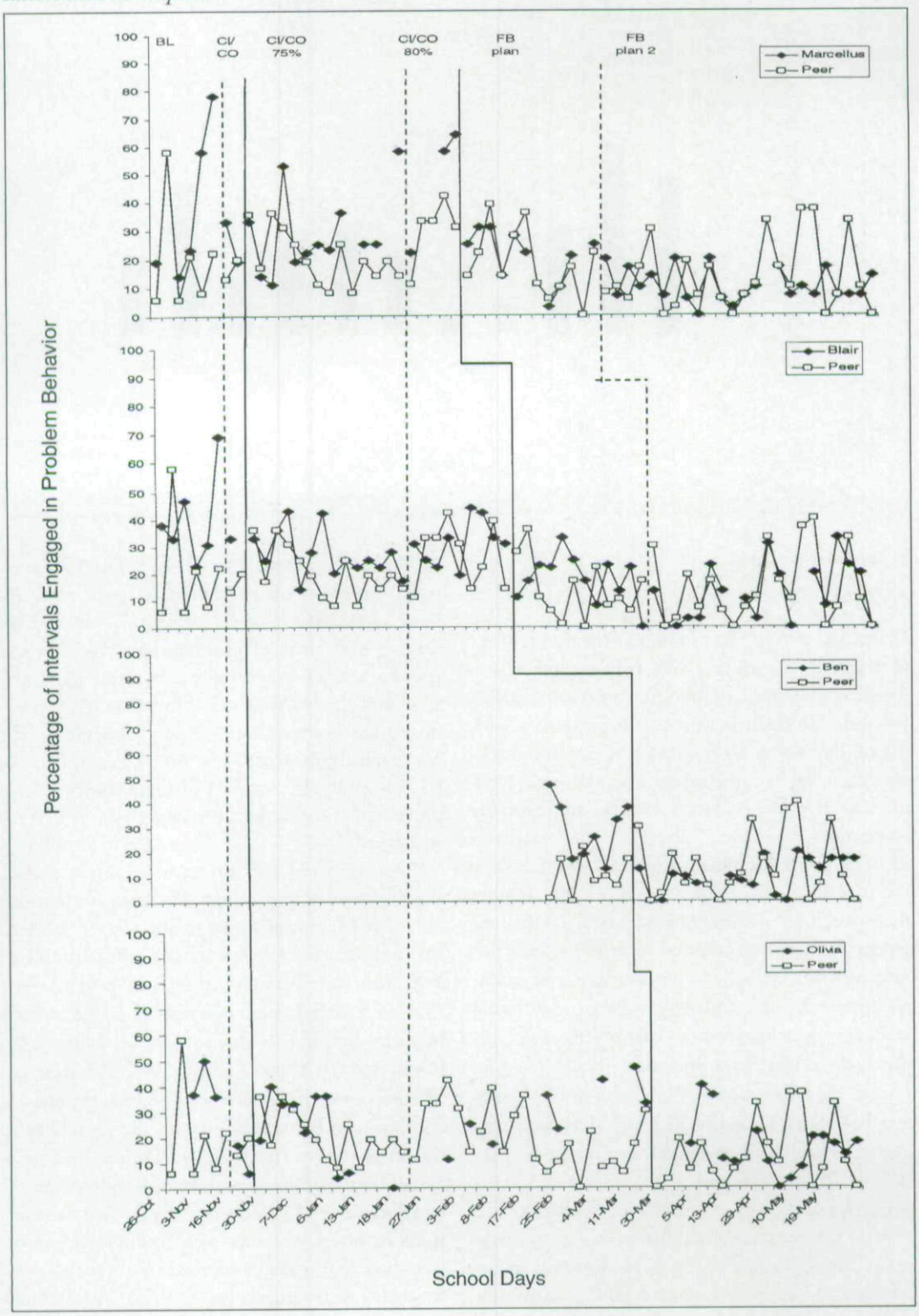
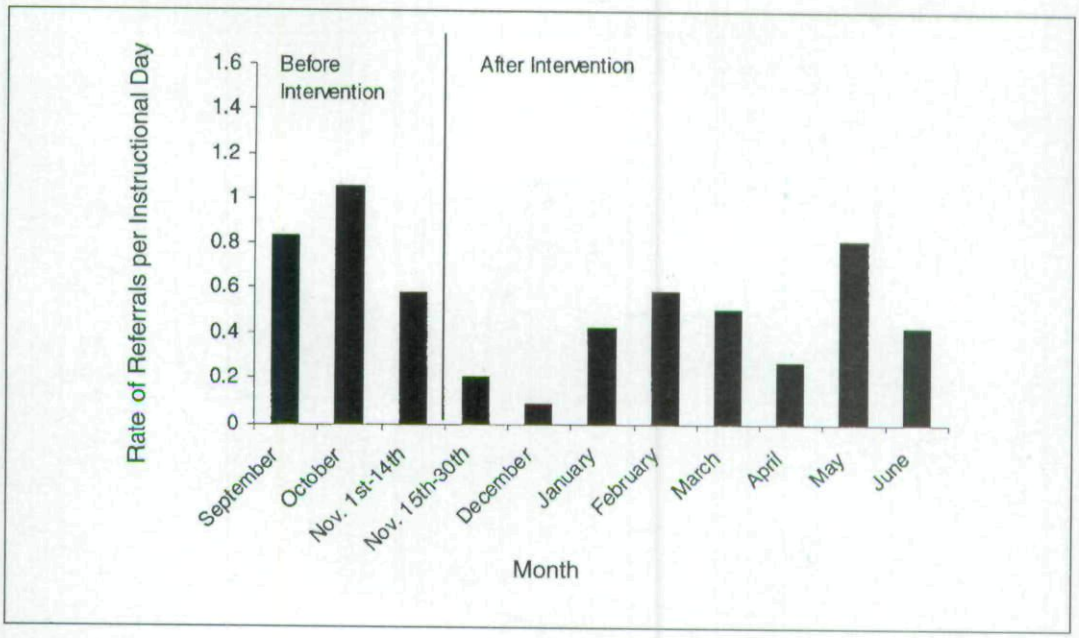


FIGURE 7

Office Discipline Referrals (Major and Minor) by Month



DISCUSSION

Overview of Results

Given the increasing number of demands (e.g., high-stakes assessments, differentiated instruction for diverse learners, public outcome accountability, individualized instruction for students with disabilities) being experienced by classroom teachers and schools, the efficient adoption and accurate use of evidence-based practices are especially important priorities. The RTI logic has been identified as a promising approach to improving the identification of students who might require more intensive instructional support. In this approach, a failure to respond to typically effective interventions is used as a marker for more intensive interventions, and may assist in identifying students who might require specially designed, individualized education programs.

In the context of students who display problem behaviors, a similar RTI logic has been suggested in efforts to establish continua of positive behavioral interventions at the school and classroom levels (Sugai et al., 2000; Walker et al., 1996). The purpose of this research was to investigate the application of an RTI approach to behavior support in two second-grade classrooms. Although general classroom behavior and instructional management procedures were in place in these two classrooms, 10 students continued to display high rates of problem behaviors. In response, a more intensive intervention (CICO) was introduced (Study 1). More intensive function-based interventions were individually developed and implemented for the nonresponders to CICO (Study 2). For each of these students, improvements in problem behaviors were observed and noted.

More specifically, the results suggest that a slightly more intensive but efficient intervention (i.e., CICO) was effective in supporting the behavioral success of four students whose problem behaviors were initially unresponsive to general classroom management practices (e.g., reductions in mean intervals with problem behavior from baseline to CICO were at least 38% and greater). For four other students whose problem behaviors continued to be unresponsive to the more intensive interventions, more individualized, function-based interventions were indicated and proved to be effective in the classroom setting (e.g., reductions in mean intervals with problem behavior from baseline to function-based phases for all participants were greater than 60%). Additional

information on the fidelity of implementation of CICO and function-based interventions, office discipline referral patterns, teacher social validation ratings, peer control, and peer composite rates of problem behavior corroborated the usefulness of an RTI approach to social behavior screening and intervention. For example, all participants engaged in fewer average intervals with problem behavior than composite peers, during the intervention phases in which they were most successful.

This research has a number of notable features. First, most aspects of the intervention development and implementation were conducted and informed by the classroom teacher and counselor. The fact that school personnel could design and implement interventions with high fidelity reinforces the potential usefulness of the CICO and function-based interventions.

Second, although we had hoped that the CICO intervention would be successful with a larger number of students, we learned that specification and consideration of the factors that contribute to the occurrence of problem behavior should be used to predict the likelihood that CICO would work and the need for more individualized interventions. For design purposes, nonresponsive students were maintained in the CICO condition for extended numbers of sessions. The results from this research would suggest that teachers shift to more individualized interventions much earlier in CICO implementation. Similarly, because the CICO intervention was characterized by high rates of teacher attention, students for whom adult attention is not a reinforcer or is an aversive should be provided an adapted version of CICO that reduces adult attention, increases self-management, and provides more salient reinforcers.

Finally, teachers reported that the interventions were easy to implement and improved the general climate of the classroom, and that being on CICO or an individualized plan was viewed as a positive experience by students. For example, one teacher reported that when a CICO student was absent, another student who was not recommended for CICO volunteered to be a "leader" and follow the CICO procedures.

Research Limitations

Before discussing the implications and recommendations that are associated with the findings, important limitations in this research need to be noted. First, because this research was conducted in two classrooms in one school, we are limited in making generalizations about the efficacy of the CICO and function-based approach to RTI to conditions that differ from this study. Researchers should conduct additional replications across a range of grades and schools and with students with varied behavioral profiles and personal demographics.

Teachers reported that the interventions were easy to implement and improved the general climate of the classroom, and that being on CICO or an individualized plan was viewed as a positive experience by students.

Second, we conducted this research in actual second-grade classrooms where many typical, but unpredictable changes, interruptions, and variations occurred in schedules, routines, and personnel. Some of the variability in student responding could be associated with such variations.

Third, two students who were not successful under the CICO condition did not receive more intensive function-based interventions, in part because of classroom and parental factors. Although these students functioned as opportunistic peer controls, a test of their responsiveness (replications) to more intensive interventions would have been desirable. Similarly, data collection was discontinued at the end of March, which did not permit comparisons with student responding in April and May.

Fourth, results from secondary data sources, office discipline referrals and teacher social validity questionnaires do not provide experimental support for the CICO and function-based interventions. Although quantitatively both sources of data positively favor CICO and function-based interventions, improvements in student behavior could be associated with other plausible explanations. For example, teachers may have decreased

their likelihood of referring students to the office by virtue of their participation in this study. However, these data add to conclusions derived from primary data sources and provide additional social validation information.

Fifth, because observers were also researchers in this study and provided some technical support to classroom teachers, they may not have been objective and consistent in how they identified, rated, and scored observation data (e.g., reactivity, drift). However, high levels of interobserver agreement suggest that observers were accurate and consistent in their direct observation responsibilities.

Sixth, although a multiple baseline design across four students was possible for the four students whose behaviors required function-based interventions, a similar controlled staggering of interventions was not possible during the CICO conditions. The design limitation is ironically a strength of the CICO intervention, because the objective is to provide teachers with an efficient means of intensifying an intervention for students whose behaviors are not responsive to the general classroomwide system. In this instance, CICO consisted of a common routine for self- and teacher evaluation against a common set of behavioral expectations at set times during the day. In addition, the group average was calculated at the end of the day, and a classroomwide positive reinforcer could be presented. Therefore, all qualifying students, by design, were introduced to CICO at the same time.

Finally, Helena and Jade had fewer data points than other participants—especially across CICO phases—because of their clear and positive response to intervention. In addition, Helena moved from the school. However, their responding under the general CICO conditions was clearly improved compared to baseline conditions, and levels of problem behavior were clearly comparable to composite peers. Because he entered the study later than the other participants, Ben's data are not as complete or readily comparable to the other participants receiving function-based support; however, his data do provide additional information (one replication) about the impact of function-based support following CICO intervention.

Implications and Recommendations

Given the limitations and the observed results, the findings from this research offer support for the application of the RTI logic to the implementation of more intensive behavioral interventions for students whose behaviors are not responsive to less intensive interventions. Although the CICO and function-based interventions in this research are evidence-based, guidelines are still needed for knowing when to implement and when to increase the intensity of interventions across the three-tiered logic.

The results from this research were obtained by using actual school personnel to implement interventions in actual classroom contexts. This feature of the research increases the ecological validity and utility of CICO and function-based interventions in real school environments.

Although CICO is an evidence-based practice, the results from this research demonstrate that the behaviors of some students are not improved (nonresponders). An important implication is the need to learn more about the contexts in which evidence-based interventions are likely to have an effect, and the adaptations that might be needed to improve outcomes for more students. Function-based support technologies might represent a useful means of guiding such intervention adaptations.

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