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A Randomized Trial Examining the Effects of Conjoint Behavioral Consultation and the Mediating Role of the Parent–Teacher Relationship

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Abstract. The present study is a large-scale randomized trial testing the efficacy of a family–school partnership model (i.e., conjoint behavioral consultation) for promoting behavioral competence and decreasing problem behaviors of students identified by their teachers as disruptive. The focus of this study is on student behavioral outcomes and the potential role of parent–teacher relationships as a mediating variable. Two hundred seven students, from 82 classrooms, and their families and teachers participated. Results indicated that, relative to the control group, students in the conjoint behavioral consultation condition demonstrated greater increases in adaptive behaviors and social skills over the 8-week intervention period. Compared to teachers in the control group, those in the experimental conjoint behavioral consultation condition demonstrated significantly greater change in their reported relationships with parents. Furthermore, improvements in teacher-reported relationships with parents mediated the effects of conjoint behavioral consultation on positive changes in children's behaviors. Interpretation and implications of these findings are discussed.

Young children manifesting disruptive behaviors, defined as recurrent patterns of negative, defiant, or externalizing behaviors directed outwardly by the child, often in excess and considered inappropriate by teachers and other school personnel, are at risk for long-term pervasive problems (Rose, Rose, & Feldman, 1989). Many students who demon-

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strate serious social-behavioral problems do so across their multiple life contexts (homes, schools, community). In many cases, the specific manifestation of problems is context and respondent specific (Achenbach, McConaughy, & Howell, 1987; McCombs Thomas, Forehand, Armistead, Wierson, & Fauber, 1990). Thus, it is important for comprehensive intervention plans to address the unique perspectives and contributions of the primary systems or environments that contribute children's developmental trajectories. However, there are few evidence-based home–school intervention models that effectively target joint efforts to promote positive student behaviors at home and at school, and that assess treatment effects as manifested in both settings.

In addition to there being few evidenced-based home–school intervention models, few evidence-based methods exist for collaborative participation of families in the intervention process. That is, few models have been specified and validated that bring families and schools together in joint problem solving and decision making. Clearly defined procedures for producing ongoing relationships between teachers and parents to improve student performance have not been well researched. Interventions that incorporate effective parent and teacher practices (i.e., combine effective family interventions and classroom-based strategies) and emphasize cooperative decision making and behavior plan implementation show potential for lasting benefits (Taylor & Biglan, 1998), which suggests that parent–teacher relationships could be a mediating variable in an ecological family–school partnership intervention on student behaviors across home and school contexts.

Conjoint behavioral consultation (CBC; Sheridan & Kratochwill, 2008) is an indirect service-delivery model that builds on positive parent–teacher relationships, integrates structured data-based problem solving and collaboration, and implements evidence-based interventions across home and school settings. The three interrelated goals of CBC are to address student concerns that interfere with learning or development, build the capacity of families and schools to support children's goals, and strengthen relationships between families and schools. In the following sections, we will discuss CBC and the research supporting it.

Description of CBC

Grounded in ecological-systems thinking (Bronfenbrenner, 1979), CBC's theory of change contends that healthy and supportive systems (settings) in children's lives, and positive interactions and relationships among them, result in enhanced developmental (e.g., learning, behavioral) outcomes for students. CBC provides a mechanism through which parents, as key partners in educational decision making, actively participate in educational planning for their child (Sheridan, Clarke, & Burt, 2008). As joint consultees, parents and teachers together participate in the entire consultation process. Problems are identified, defined, analyzed, and treated through mutual and collaborative interactions between parents and teachers with the guidance and assistance of an educational consultant (Sheridan, Kratochwill, & Bergan, 1996; Sheridan & Kratochwill, 2008). CBC promotes a strengths-based, partnership model that creates opportunities for families and schools to work together around a common interest, and to build on and promote capabilities and strengths of family members and school personnel.

CBC operates through a highly collaborative process between parents and teachers, guided by a consultant who specializes in data-based problem solving and evidence-based interventions. Collaborative relationships within CBC are defined in the context of a partnership where parents and teachers experience complementary roles and mutual responsibilities. Frequent and meaningful dialogue among parents and teachers results in coordinated and consistent messages related to learning (Christenson & Sheridan, 2001), and conditions for children to experience continuities across systems. In theory, the interactions and relationships created among systems (the mesosystem) are highly influential in establishing values, expectations, and contingencies

that are connected, complementary, and reinforced across environments. This plays out through the articulation of shared goals, implementation of consistent plans, and adoption of mutual and coordinated responsibility for problem solving. All of these processes are predicated on the presence of a relationship between families and schools (Clarke, Sheridan, & Woods, 2009). However, the operative role of the parent–teacher relationship within CBC has not been the subject of empirical research to date.

Research Regarding CBC

In a review of the efficacy of family–school and parent consultation interventions (Guli, 2005), CBC was identified as one of the few that demonstrated evidence of efficacy for dealing with school-related problems. Results of a 4-year training project that tested the effect of CBC with students in kindergarten through the ninth grade yielded excellent case outcomes on measures of student behavior and large effects (Sheridan, Eagle, Cowan, & Mickelson, 2001). Further, multiple linear regression (examining the relationships between child age, case complexity, severity of symptoms, and individual effect size) found that a model fitting child age and severity predicted school effects relatively well. Specifically, older children (11 and older) with less severe (relative to more severe) symptoms and younger children (aged 5 to 7) with more severe (relative to less severe) symptoms experienced higher effect sizes as a function of CBC. In at least two studies using multiple baseline experimental methodology, CBC was superior to other consultation interventions in ameliorating child social and learning problems, including teacher-only consultation (Sheridan, Kratochwill, & Elliott, 1990) and self-training manuals (Galloway & Sheridan, 1994). CBC was found to be highly effective for addressing academic performance deficits (Weiner, Sheridan, & Jenson, 1998) and internalizing concerns (Sheridan & Colton, 1994). Specific to the efficacy of CBC for students with behavioral problems, Wilkinson (2005) reported a significant increase in teacher ratings of behavioral control (e.g., on-task and compliant behavior) and a decrease in aggression, attention problems, and externalizing behaviors from baseline to treatment, with positive treatment effects maintained at the 4-week follow-up. Positive effects have also been found for children with medical needs (Lasecki, Olympia, Clarke, Jenson, & Heathfield, 2008; Sheridan, Warnes, Woods, Blevins, Magee, & Ellis, 2009) and in early childhood samples (Sheridan, Clark, Knoche, & Edwards, 2006).

Despite decades of promising research on CBC, outcome studies have been limited to those using small samples and single-case designs. To date, there has been no large-scale randomized trial evaluating the efficacy of CBC for addressing student behaviors. Although replication of effects has been demonstrated across diverse samples and outcomes, design features have limited our ability to draw definitive conclusions regarding its efficacy and understand the mechanisms responsible for effects. Furthermore, there has been no attempt to determine the effects of CBC on the relationship between parents and teachers. This study represents the first large-scale CBC study with randomly assigned groups, with the intent of also exploring pathways by which CBC effects are produced. Findings will allow for the specification of treatment effects for a larger sample of participants demonstrating problem behaviors, provide opportunities to explore questions regarding operative elements, and investigate the salience of the theoretical underpinning of the model, exploring the relationships among systems as significant contributors of child outcomes.

Purpose of Study and Research Questions

The purposes of this study are to (a) determine the efficacy of CBC for enhancing prosocial behaviors in children with disruptive behaviors both in the school and at home; (b) identify its effects on parent–teacher relationships; and (c) determine the role of the parent–teacher relationship in CBC as a possible mediator of its effects. CBC was implemented

using a large-scale cluster randomized trial (Shadish, Cook, & Campbell, 2002) with small classroom groups of two to three students with teacher-reported disruptive behaviors. Specific research questions are as follows: (a) What is the effect of CBC on prosocial, adaptive, and disruptive behaviors for children in kindergarten through third grade? (b) What is the effect of CBC on parent and teacher perceptions of the parent–teacher relationship? (c) Does the parent–teacher relationship mediate the effects of CBC on child outcomes? In addition, the social validity (i.e., treatment acceptability) of CBC was investigated.

Methods

Participants and Setting

Two hundred seven students in kindergarten through third grade and their parents and teachers served as participants in this study. The study took place in 21 schools in a moderately sized Midwestern city and surrounding communities. Classrooms served as the unit of randomization with 2 to 3 students per classroom. Eighty-two different classrooms (43 in the treatment condition; 39 in control) were involved.

Students and recruitment. Seventy-five percent of student participants were males. Across treatment and control conditions, students' average age was 6.52 ($SD = 1.11$); 26% were kindergarten students, 35% were in the first grade, 26% were in second grade, and 13% were in third grade. Seventy-five percent were reported by parents to be White/non-Hispanic, 9% African American, and 16% were of other racial and ethnic backgrounds (i.e., Latino, American Indian, Asian, Native Hawaiian, Middle Eastern, or biracial). Nearly half (49%) of students met criteria for free and reduced-price lunch, with 38% of students living 1.5 times below the poverty threshold. Four percent lived in households where English was not the primary language spoken, and 24% had only one adult residing in the home. On average, 35% of students received special education services for an average of 60.05 min (15%) of their school day. In addition, 34.4% of students received some additional services for behavioral, social, or emotional problems, such as outpatient services or family counseling. See Table 1 for additional demographic characteristics.

All students were selected based on teacher-reported concerns regarding the presence of disruptive behaviors. Recruitment of students followed a multistep procedure. The first step involved teacher nomination, wherein teachers rank ordered the top 10 students with disruptive behaviors (e.g., noncompliance, aggression) within their respective classrooms. Second, teachers completed (a) the Systematic Screening for Behavior Disorders (Walker & Severson, 1990) rating scale for the top 5 ranked children, and (b) a researcher-developed checklist assessing frequency and severity of disruptive behaviors and the need for additional intervention (scale = 1 to 9, *low* to *extreme*). Students who (a) scored in the "elevated" or "extremely elevated" risk categories on the Systematic Screening for Behavior Disorders, and/or (b) were reported to exhibit disruptive behaviors that interfered with learning at a moderate to extremely severe level or moderate to extremely frequent level, or demonstrated moderate to significant need for additional services, met criteria for inclusion; their parents were contacted and invited to participate. The parents were then provided information about the study, and consented for their own and their child's participation. In cases where more than 3 students in a classroom met criteria for inclusion, 3 were randomly selected for participation. The mean rating for severity of problem behaviors at baseline was 6.66 ($SD = 1.38$). The difference in problem severity between control ($M = 6.47$; $SD = 1.40$) and CBC ($M = 6.82$; $SD = 1.35$) groups was not statistically significant: $t(189) = -1.80$, $p = .074$.

Parents. Two hundred seven parents participated in this study, the majority (90%) of which were female. The average age for parents was 34.73 ($SD = 7.83$) years. Eighty-

Table 1
Demographic Characteristics of Participants

	Total (N = 207)	Experimental (N = 113)	Control (N = 94)
Mean (*SD*) Student Age[a]	6.52 (1.11)	6.47 (1.07)	6.59 (1.15)
Mean (*SD*) Student Grade[a]	1.26 (.98)	1.22 (.97)	1.32 (1.0)
Mean (*SD*) Behavior Severity (1-9)[a,b]	6.66 (1.38)	6.82 (1.35)	6.47 (1.40)
Mean (*SD*) Number of Risks[a]	0.68 (0.82)	0.80 (0.82)	0.54 (0.80)
Student Gender[c]			
Male	75%	77%	72%
Female	25%	23%	28%
Student Ethnicity[c]			
White, non-Hispanic	75%	69%	82%
African-American	9%	11%	6%
Other	16%	20%	12%
Risk Factors[c]			
Non-English Language at Home	4%	6%	1%
Fewer than Two Adults in Home	24%	26%	23%
Maternal Education Less than High School	5%	6%	5%
Low Income	38%	44%	31%
Disability Status			
Students with ≥1 Disabilities	44%	48%	38%
Receives Special Education Services	35%	39%	29%

[a] Independent samples *t*-tests yielded no significant difference ($p > .05$) between treatment and control groups.
[b] Baseline rating of severity by teachers from 1 (low) to 9 (extreme).
[c] Chi-square test of independence yielded no significant difference ($p > .05$) between treatment and control groups.

eight percent were White/non-Hispanic, 4% were African American, 4% were Latino, and the remainder self-reported as other. Five percent did not have a high school degree; 18% earned a high school diploma (or equivalent) only. Fifty-one percent completed some college, 33% had a college degree, and 8% had an advanced graduate degree.

Teachers. Eighty-two general education teachers of participating students also served as participants. Ninety-seven percent of the teachers were female, and all self-reported as White/non-Hispanic. The average number of years in which teachers were in their current position was 9.73 (SD = 9.77).

Consultants. Consultants were eight clinicians/graduate students trained in school or counseling psychology. All were female and self-reported as White/non-Hispanic. Consultants' average age was 25.38 (SD = 2.07); they had completed an average of 2.63 (SD = 1.69) years of graduate education. Consultants participated in a 64-hr, criterion-based training program conducted over 4 weeks. Training included didactic instruction on the theory and practice of CBC, readings about and tool kits for evidence-based behavioral interventions, video demonstrations, role-plays, self-monitoring, and individualized supervision.

Study Variables

The independent variable was conceptualized as comprising two primary elements: CBC and the behavioral interventions implemented within the consultation context. The dependent variables were parent- and teacher-reported adaptive behaviors, social skills, and disruptive behaviors. Our interest in promot-

ing positive social and adaptive behaviors for children identified as disruptive was grounded in research attesting to its relatively stronger predictive power in children's learning and academic achievement than negative behaviors (Capara, Barbanelli, Pastorelli, Bandura, & Zimbardo, 2000), especially for students with externalizing behaviors (Kwon, Kim, & Sheridan, in press) and attention deficit hyperactivity disorder (Volpe et al., 2006). Parent and teacher perceptions of the parent–teacher relationship were also constructs of interest.

Measures

Child outcomes. Measurement of child behavior change as a function of group assignment (CBC or control) occurred for both home- and school-based behaviors. Two standardized measures, completed by parents and by teachers, were used to assess child behavior. First, the Behavior Assessment System for Children, Second Edition (BASC-2; Reynolds & Kamphaus, 2004) child- (ages 6 to 11) and preschool-level (ages 2 to 5) forms were completed by parents and teachers. BASC-2 Adaptive Skills and Externalizing Problems composite scores ($M = 50$; $SD = 10$) represented primary outcome measures. Overall alpha coefficients for the standardization sample ranged from .90 to .97, and evidence of the scale's validity has been reported (Reynolds & Kamphaus, 2004). The Adaptive Skills composite is composed of Adaptability, Social Skills, Leadership, Activities of Daily Living, Study Skills, and Functional Communication subscales. The Externalizing Problems composite includes subscales of Hyperactivity, Aggression, and Conduct Problems. Second, the Social Skills Rating System (SSRS; Gresham & Elliott, 1990) was used to measure the frequency of social skills (0 = *never*, 1 = *sometimes*, 2 = *very often*) across three subdomains (Cooperation, Assertion, and Self-control). A total Social Skills standard score is derived ($M = 100$; $SD = 15$). Internal consistency estimates reported by the authors range from .65 to .94 (Gresham & Elliott, 1990).

Parent–teacher relationship. The effects of CBC on parent–teacher relationships were assessed using the Parent-Teacher Relationship Scale—II (Vickers & Minke, 1995). Both parents and teachers completed this scale. Internal consistency for the current sample was found to be high ($\alpha = .91$ to .94 for parents and teachers, respectively). High scores on the Parent-Teacher Relationship Scale—II indicate that respondents feel (a) positively about their relationship with the other person, and that (b) communication between the two is effective.

Covariates. Several meaningful pretreatment covariates were considered in assessing the effects of CBC on outcome variables. Pretreatment behavior severity, rated by the child's teacher on a scale from 1 (*low*) to 9 (*extreme*), was deemed important because behavior problems that are severe and consistent enough to alter normal development in the early years are considered to be clinically significant (Keenan & Wakschlag, 2000). Likewise, research has consistently supported a cumulative risk hypothesis positing that the number of risks early in a child's life predicts behavior problems later (Appleyard, Egeland, van Dulmen, & Sroufe, 2005). For this study, *cumulative risk* was defined as the total number of factors experienced by a child that may place him or her at risk; namely, language other than English was spoken in the child's home, the presence of fewer than two adults in the home, maternal education that is less than a high school degree, and living 1.5 times below the poverty threshold. The presence of a disability (e.g., conduct disorder, attention deficit hyperactivity disorder, oppositional defiant disorder) is considered significant given the propensity for students with identified disorders to continue showing maladaptive behaviors even after intervention is implemented (Offord & Bennett, 1994). A disability was considered present if the child had a clinical diagnosis as reported by his or her parent, or if the child received special education services as reported by his or her teacher.

Acceptability of CBC. Parents and teachers acceptability of CBC was assessed with a revised version of the Acceptability

factor of the Behavior Intervention Rating Scale (BIRS; Elliott & Von Brock Treuting, 1991), composed of 15 items rated on a 6-point Likert scale. Minor modifications to the original BIRS for use in consultation research were made previously (Sheridan et al., 2001), and its psychometric properties were maintained (Freer & Watson, 1999; Sheridan & Steck, 1995). Example items include "I would suggest the use of this consultation model to other parents" and "I liked the procedures used in this model of consultation." Internal consistency estimates for the present sample were $\alpha = .95$ for parents and $\alpha = .96$ for teachers.

Procedures

Business as usual. Small groups of 2 to 3 students within classrooms were randomly assigned to either the experimental (CBC) condition or a "business as usual" control condition. *Business as usual* was defined as traditional school support provided by school personnel (office referrals, Student Assistance Teams, and pull-out placements in special education classrooms) or support services solicited by parents outside of school. There were no differences between experimental and control groups on the proportion of students who received special education services, $\chi^2(1) = 0.324$, $p > .05$; amount of time special education services were received daily, $t(45) = 1.388$, $p > .05$; or receipt of additional services for behavioral, social, or emotional problems, $\chi^2(1) = 0.656$, $p > .05$.

Conjoint behavioral consultation. The structure for CBC casework was based on Sheridan and Kratochwill (2008). Specifically, CBC implementation occurred in a series of stages composed of meetings and between-session assessment and intervention supports. Except when otherwise noted, consultation sessions took place within small groups of one teacher, two to three parents of students within the classroom, and one consultant. Within each classroom, a consultant met with a teacher and two to three parents for approximately four to five conjoint consultation sessions over approximately 8 weeks. All meetings occurred in teachers' classrooms, and were between 45 and 60 min in length (see interview objectives in Table 2).

The first of a series of structured interviews was the Needs Identification/Analysis ("Building on Strengths") Interview (based on Sheridan & Kratochwill, 2008). The primary foci of this interview were to identify the specific disruptive behaviors that interfered with students' learning and specify alternative prosocial goals for students. Given the sensitive nature of this interview, involving discussion of students' challenges, these interviews were conducted with individual parents, their child's teacher, and a consultant. All target behaviors can be described as disruptive. They were operationalized in ways unique to home or school based on their topography and priorities in each respective setting. At home, 42% of all identified behaviors involved noncompliance, followed by interference (33%), disengaged behavior (22%), and aggression (3%). At school, 47% of target behaviors were disengaged behavior, 31% interference, 19% noncompliance, and 2% aggression. Goals were structured in ways that promoted replacement (i.e., desired) behaviors.

The emphasis of the Plan Development and Implementation ("Planning for Success") Interview (Sheridan & Kratochwill, 2008) was the co-construction of intervention plans to address target concerns (see next section) and support of parents' and teachers' implementation of plans with fidelity. The final interview, the Plan Evaluation ("Checking and Reconnecting") Interview (Sheridan & Kratochwill, 2008) focused on evaluating the plan(s), discussing progress made toward goals, and determining needs for plan modification or discontinuation. These last two interviews were conducted in small groups (one consultant, one teacher, and parents of 2 to 3 students within classrooms).

Behavioral intervention plans. Behavioral plans for each student used strategies that had empirical support. Delivery elements were specified to accommodate differences between students and preferences of consultees. Four classes of evidence-based interven-

Table 2
Objectives of Small Group Conjoint Behavioral Consultation Interviews

Interview	Objectives
Needs Identification/Analysis Interview ("Building on Strengths")	• Jointly identify and define child's needs and priorities in behavioral terms. • Determine a primary behavior to address (target behavior) for initial intervention. • Collaboratively develop appropriate goals for target behavior across home and school. • Discuss what is happening before and after the priority behavior, as well as specific patterns that occur, during the focused time/setting. • Jointly establish a procedure to collect baseline data across settings.
Plan Development and Implementation Stage ("Planning for Success")	• Collaboratively develop a plan built upon strengths and competencies to address the priority behavior across home and school. • Train parents and teachers in plan implementation as necessary. • Implement agreed-upon intervention across home and school settings. • Make immediate modifications to plan as necessary. • Support implementation of behavioral plan at home and school through observing, providing feedback, modeling, and troubleshooting. • Assess immediate changes in student's behavior.
Plan Evaluation Stage ("Checking and Reconnecting")	• Determine if the goals for the priority behavior have been met. • Discuss effective elements of the intervention plan. • Discuss continuation/termination of plan. • Schedule additional interview if necessary, or terminate consultation.

Note: Due to their sensitive nature, Needs Identification/Analysis Interviews were conducted with individual parents, their child's teacher, and a consultant. All other interviews were conducted in small groups with one teacher, parents of 2–3 children in their classroom, and a consultant.

tion strategies that reduced disruptive and promoted prosocial behaviors comprised the pool from which individualized behavioral plans were developed: (a) positive reinforcement/consequences (e.g., attention, rewards; Moore, Waguespack, Wickstrom, Witt, & Gaydon, 1994); (b) environmental structuring and antecedent control (e.g., structured prompts and checklists, precision requests, rules; Musser, Bray, Kehle, & Jenson, 2001); (c) skills training (e.g., social skills training, behavioral rehearsal; Pfiffner & McBurnett, 1997); and (d) reductive techniques (e.g., removing privileges or rewards, response cost; McMahon & Forehand, 2003). All interventions promoted home–school communication through home-notes and other consistent means (McCain & Kelley, 1994).

A large number of individualized plan strategies were possible within these four intervention classes. The Tough Kid Toolbox (Jenson, Rhode, & Reavis, 2010), The Tough Kid Social Skills Book (Sheridan, 2010), and The Tough Kids Parent Book (Jenson, Rhode,

& Neville, 2010) provided examples of individual plans based on the four classes of research-based interventions. Treatment protocols and manuals were developed to translate the interventions into formats conducive for consultation use. Specifically, the CBC Behavioral Strategies Toolkit, consisting of 80 different intervention plans, was developed to standardize plan tactics for use in CBC casework. Individuation occurred at the level of specific reinforcers, schedules of reinforcement, and other idiosyncratic elements of individualized plans.

Each strategy was coded into one of the four intervention classes (i.e., positive consequences, antecedent control, skills training, reductive techniques). One individual reviewed all case files (e.g., interview notes, intervention summaries) for evidence of intervention information. Key terms describing each strategy were recorded (e.g., "praise" was recorded when the strategy was recorded as "praise the child for raising his hand"). Sources in the behavioral intervention literature (e.g., Rathvon, 2008; Rhode, Jenson, & Reavis, 1992) were reviewed to confirm that the four-category classification was consistent with common taxonomies of behavioral interventions. Three coders then independently coded each intervention term into one of the four categories. Percent agreement between coders was computed and found to be 90% overall, with 51 interventions (96.23%) agreed on by two of the three coders. The group met to discuss the interventions for which there was less than 100% agreement ($n = 12$) and gained consensus through discussion and rationale building.

Beyond home–school notes, positive consequences occurred most frequently in home and school intervention packages (i.e., 97.3% and 95.6%, respectively). This was followed by antecedent control strategies, which were contained in 66.4% and 57.5% of home and school intervention packages, respectively. Skill building was a part of 24.8% and 41.6% of home and school intervention packages, respectively. Finally, reductive techniques were included in 10.6% and 13.3% of home and school intervention packages, respectively. For each setting, the average number of behavioral strategies comprising intervention packages was 2 ($M = 2.08$, $SD = 0.70$ for school-based and $M = 1.99$, $SD = 0.57$ for home-based interventions, respectively).

Fidelity support. Consultants used several strategies to support parents and teachers as they implemented behavioral intervention plans, including manuals and scripted intervention plans, classroom and home-based observations with feedback, modeling, and recurrent phone/e-mail contacts for troubleshooting and support (Swanger-Gagné, Garbacz, & Sheridan, 2009). Consultants also provided additional training related to behavior plan implementation in the home and classroom settings during the treatment plan implementation stage. On average, families received one home visit by their consultant to ensure parents' understanding of and skills at effectively delivering the intervention and to help parents determine methods for integrating behavioral plans into their daily routines (range = 0 to 4).

To maximize fidelity of CBC and quality of service delivery and retain experimental control as required in a randomized trial, consultant supervision was provided by master's level, experienced consultants. Consultants received 1 hr of individualized and 1 hr of group supervision per week to address specific individualized case issues such as identifying and defining target behaviors, assessing behavioral function, reviewing plan components, and supporting plan implementation fidelity.

Fidelity Assessments

A multimethod, multisource, multisetting approach (Perepletchikova, Treat, & Kazdin, 2007) was used to assess the fidelity of the CBC meeting procedures and the fidelity with which parents and teachers implemented behavioral plans in their respective settings (also see Sheridan, Swanger-Gagné et al., 2009).

Fidelity of CBC meeting procedure. Adherence with which consultants followed the objectives of CBC was assessed with the

CBC Objectives Checklists (Sheridan et al., 2001), adapted to conform to the small-group consultation format. Each CBC interview consisted of specific objectives defining accuracy of delivery by consultants. The Needs Identification/Needs Analysis (Building on Strengths), Plan Development and Implementation (Planning for Success), and Plan Evaluation (Checking and Reconnecting) Interviews consisted of 20, 10, and 10 objectives, respectively. Trained, independent coders listened to 45% ($n = 94$) of all interviews conducted and recorded ($n = 211$), selected randomly to represent each CBC stage equally, and coded the presence of each objective on the checklists. Close to 20% of these were coded by two observers to assess inter-rater agreement.

Fidelity of behavior plan implementation. Three methods were used to assess behavioral plan implementation fidelity: self-report, permanent products, and direct observation. Each yields an estimate of adherence of intervention implementation, computed as the percentage of fidelity criteria met by parents and teachers. Criterion-based fidelity checklists were developed for each behavioral intervention plan. Each of the criterion steps listed on the checklists were transferred onto self-report, permanent product, and direct observation forms as appropriate (with the exception of some intervention steps that were not observable on permanent products or through direct observation and were included on the self-report forms only). Each intervention contained 3 to 12 criteria (steps) that defined accurate implementation (e.g., praised student for prosocial behavior during recess); each step was scored as "Yes" (step completed), "No" (step not completed), or "NA" (not applicable, in cases where child was not present, prerequisite conditions were not met, or other extenuating circumstances).

All permanent products collected were scored by two observers to assess inter-rater agreement of intervention implementation. Exact agreement across raters was 87.93% and 98.70% for home and school permanent products, respectively. Inter-rater reliability for the permanent product measures was computed using intraclass correlation coefficients (ICC), interpreted as the percent of the variability in fidelity scores that are due to the differences across the cases that were rated, controlling for chance agreement. An ICC of 0.986 for school and 0.63 for home measures suggests that 98.60% and 63% of the variability in permanent product fidelity scores was from the difference across the cases that were rated. ICCs for two raters were estimated at 0.99 for school-based permanent products and 0.77 for home.

Self-report measures were used to assess parents' and teachers' reported adherence to implementation and yielded estimates of fidelity computed as the percentage of steps of an intervention completed daily by each consultee. Permanent products (e.g., charts, home-notes) were used daily as a part of behavioral interventions. Items from the self-report forms that were observable on permanent products were listed on a permanent product record form (e.g., received sticker for work completed, signed home-note daily) and scored by independent coders. Direct observations of teachers implementing interventions were conducted by consultants using direct observation protocols including observable items on criterion checklists. They were conducted once a week over 4 weeks of intervention for 100% of teachers and scheduled during times of the day when interventions were being implemented.

Experimental Design

A four-cohort, cluster-randomized, experimental design was employed. Small groups of 2 to 3 students within classrooms were randomly assigned as a group to either the experimental (CBC) condition or the business as usual control condition. The small classroom group assignment was necessary to allow more than 1 student per classroom to participate without unduly stressing teachers' time commitments and still account for an individual teacher's influence on multiple students. Participants were assessed approximately 1 week prior to the start of CBC (pre-

test) and approximately 12 weeks later (posttest, when interventions were no longer in place). Some variability occurred because of normal deviations in school schedules, such as absences, school holidays, and weather-related disruptions.

Data Analytic Plan

Intervention efficacy. To assess the effect of CBC on student behaviors and parent–teacher relationships as measured by parent and teacher reports, a four-level longitudinal multilevel model (Raudenbush & Bryk, 2002; Snijders & Bosker, 1999) was implemented as a mixed linear model using SAS PROC MIXED (Singer, 1998). This approach took into account the complex hierarchical nesting created from the complex sampling paradigm employed in this study. Repeated measures (Level 1) were nested within each child (Level 2), small groups of 2 to 3 children and their parents were nested within teachers/classrooms (Level 3), and classrooms were nested within schools (Level 4). The repeated-measures factor of time was a within-child (Level 1) predictor, and several covariates—severity, age, risk, and disability status—were entered as child-level (Level 2) predictors. As small groups of children were randomly assigned as a group to either the experimental (CBC) condition or the business as usual control condition, assignment to condition was modeled as a dummy-coded contrast variable (0 = control, 1 = CBC) at the teacher/classroom level (Level 3). The Time × Condition interaction was then a cross-level interaction. Evaluation of this interaction effect indicates the degree to which differences in pre–post outcome change are noted between treatment group participants and controls. Consultants were also entered as a school level (Level 4) fixed effect variable. The time-based repeated-measures variable was centered at baseline with the unit of time being the intervention period (0 = pre, 1 = post). The Kenward–Rogers method (Kenward & Rogers, 1997) was used to determine the denominator degrees of freedom for all tests of fixed effects and all tests of fixed effects were two-tailed hypothesis tests. Final parameter estimates for both fixed and random effects were obtained through restricted maximum likelihood estimation.

The multilevel model allows for modeling of individual differences at multiple levels of a hierarchical data structure (i.e., random effects). The random effects portion of all models featured a random intercept variance at the child and teacher/classroom levels. The within-subjects error covariance matrix was modeled with an independence structure, resulting in a single residual error variance. The random intercepts are interpreted as the between-children and between-classroom variability, respectively, in outcome levels at randomization (not all participants started at the same level). Finally, the within-subjects error is the average misfit of the model at either measurement occasion. Random effects were initially included to account for between-school variability at baseline; however, such school-level random effects were nonsignificant for all outcomes, indicating no variability in outcomes from between-school differences. Consequently, the random intercept for school was dropped from all analyses. Likewise, consultants did not have a statistically significant effect on any outcome, and the consultant fixed effect was dropped as well. These modifications resulted in a final three-level hierarchical analytic model.

Control for multiple tests in efficacy analyses. Behavior at school and behavior in the home represented two distinct dimensions of study. Adaptive behaviors, social skills, and externalizing behaviors were assessed in the school and home contexts by teachers and parents, respectively. The parent–teacher relationship was assessed by both parents and teachers. Each primary outcome was analyzed separately. To ensure that our findings do not capitalize on chance when making statistical inferences, we controlled the false discovery rate (FDR) within the overall set of eight primary outcomes using the Benjamini–Hochberg method (Benjamini & Hochberg, 1995). SAS PROC MULTTEST (Westfall, Tobias, Rom, Wolfinger, & Hochberg, 1999) was used

to calculate *p* values adjusted for false discovery rate. After adjustment for false discovery rate, significant effects on primary composite score outcomes (i.e., BASC Adaptive Skills and Externalizing Problems) were further investigated by conducting exploratory analyses on relevant subscales as follow-up tests. As exploratory analyses, such follow-up tests were not adjusted further (see Schochet, 2009).

Mediation. A multilevel path analysis was conducted to examine whether the posttest perceptions of the parent–teacher relationship mediate the positive effect of CBC on child behavioral outcomes when significant direct effects of CBC on child outcomes were detected. Multilevel path analysis is necessitated because 2 to 3 students were sampled per teacher/classroom and because teacher/classroom was the unit of randomization. Pursuant to the methods discussed in Preacher, Zyphur, and Zhang (2010), we modeled the relationship between the parent–teacher relationship and child outcomes at the within-classrooms level (Level 1) and the relationships between assignment to CBC, the classroom-average parent–teacher relationship, and the classroom-average child outcomes at the between-classrooms level (Level 2). Specifically, we modeled the indirect relationship between assignment to the CBC condition and postintervention child behavior outcomes as mediated by the postintervention parent–teacher relationship. Preintervention measures of the parent–teacher relationship and child outcomes were entered as covariates. A reduction in the direct effects from CBC to child outcomes combined with the presence of parent–teacher relationships and an indirect effect of CBC on child outcomes indicates a presence of mediation effects as one means of explaining the pathways by which CBC affects child outcomes.

Baron and Kenny (1986) outlined four steps necessary for establishing the presence of a meditated effect. Three steps involve establishing a relationship between the independent variable, the potential mediator, and the outcome variable; the fourth step involves determination of full versus partial mediation. Thus, we tested the direct effect of the CBC intervention on the parent–teacher relationship and primary outcomes to establish a relationship between the independent variable and the outcome and the mediator and the outcome. The association between the outcome and mediator is logically implied by the study hypotheses.

Results

We first provide information regarding fidelity of CBC procedures and behavioral intervention implementation. Second, we report the CBC effects on student behaviors and parent–teacher relationships. Next, we report the mediation effect of the parent–teacher relationship. Finally, we report parents' and teachers' perceived acceptability of CBC.

Fidelity of CBC and Behavioral Intervention Implementation

Close to half (45%) of all 211 CBC interviews ($n = 94$) were coded by trained coders to assess fidelity to the model. Consultants met 99% of the objectives during Needs Identification/Needs Analysis, 98% of the objectives during Plan Development and Implementation, and 98% of the objectives during the Plan Evaluation interviews. Close to 20% of coded interviews ($n = 18$) were rated by two observers, with 96% overall agreement.

Behavioral plan implementation fidelity included parent and teacher self-reports of adherence, a permanent product report at home and school, and direct classroom observation. Parent-recorded self-report forms were submitted for 50% of cases, and teacher-recorded forms were submitted for 75% of cases as one means of documenting fidelity to behavioral plans. In addition, permanent products were submitted by 68% and 52% of cases by parents and teachers, respectively. Across all methods and sources, moderate to high levels of treatment plan implementation were found. Specifically, parents self-reported as adhering to an average of 81.64% of the home intervention steps and teachers reported as adhering to an average of 92.54% of classroom interven-

tion steps. Review of permanent products from home and school interventions revealed that an average of 89.06% and 98.49% of the plan objectives were met, respectively. Finally, direct observations by consultants indicated that on average and across all teachers, 87.46% of intervention steps were delivered.

Student Outcomes at School

Table 3 presents descriptive data for all outcome variables in this study. Table 4 summarizes the fixed effects of study variables, and Figure 1 depicts significant CBC effects on child outcomes and the parent–teacher relationship. Children in the CBC group relative to controls demonstrated statistically significant positive changes on the teacher-rated outcome variables of interest, after controlling for the severity of behavior problems at baseline. First, significantly greater increases on the BASC Adaptive Skills factor were noted on teacher ratings for treatment group participants compared to controls [$\gamma = 2.15$; $t(160) = 2.34$; $p = .04$] with an effect size of $d_{RM} = 0.39$. The parameter, γ, indicates the Time × Group cross-level interaction and corresponds with the parameter estimates reported in Table 4. The cross-level interaction indicates the degree to which participants in the experimental condition differentially improved relative to the control condition. The procedure used to calculate effect sizes was recommended for use with repeated measures (Gibbons, Hedeker, & Davis, 1993; Morris & DeShon, 2002). Specifically, d_{RM} is calculated as the parameter estimate, γ, divided by the pooled standard deviation of the pretest–posttest change scores.

Interpreting effect sizes as a standardized metric under the normal curve, the average participant in the CBC condition achieved greater pre–post gains than approximately 65% of control group participants. Given the statistically significant differences in gains between treatment and control groups on the overall Adaptive Skills factor, follow-up exploratory analyses to identify the source of the effect were warranted. Of the subscales comprising the BASC Adaptive Skills factor, two yielded significant Time × Condition interaction effects, indicating potentially greater increases in the treatment group versus control group: Adaptability [$\gamma = 2.39$; $t(162) = 2.17$; $p = .03$; $d_{RM} = 0.35$] and Social Skills [$\gamma = 2.15$; $t(159) = 2.34$; $p = .02$; $d_{RM} = 0.36$].

Second, relative to children in the control group, CBC participants displayed greater increases on the teacher-rated SSRS [$\gamma = 4.69$; $t(184) = 3.07$; $p = .01$], with an effect size of $d_{RM} = 0.47$. On this measure, the average CBC participant achieved pre–post gains at a level equal to or greater than approximately 68% of control group participants. Statistically significant differences between treatment and control group participants were not evident on the BASC-2 Externalizing Problems; [$\gamma = -1.62$; $t(164) = -1.12$; $p = .27$; $d_{RM} = -0.18$].

Student Outcomes at Home

In assessing CBC effects on parent-rated child behaviors, age, number of risk factors, and child disability status were used as covariates. A greater number of risks and being classified as having a disability were related, in general, to poorer child behaviors as rated by parents (see Table 4). Children in the CBC group, relative to control group participants, were reported by parents to have demonstrated significantly greater positive change in social skills as assessed on the SSRS [$\gamma = 4.78$; $t(132) = 2.41$; $p = .04$], with an effect size of $d_{RM} = 0.42$. On this measure, the average CBC participant achieved pre–post gains at a level equal to or greater than approximately 66% of control group participants. No other significant differences between treatment and control groups over time were found in home settings, based on parent report (see Table 4 for results).

Parent–Teacher Relationship

As compared to teachers in the control group, teachers in the CBC group reported greater increases in their relationships with parents [$\gamma = 0.21$; $t(170) = 3.10$; $p < .01$; see

Table 3
Means (Standard Deviations) of the Study Variables

	Teacher Report				Parent Report			
	Control		CBC		Control		CBC	
	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test	Pre-test	Post-test
BASC-2 Adaptive Skills[a]	41.65 (7.26)	42.59 (6.54)	41.12 (6.02)	43.60 (7.35)	43.78 (9.48)	44.48 (10.03)	43.69 (12.40)	42.82 (10.09)
BASC-2 Externalizing[b] Problems	70.27 (12.00)	67.67 (10.22)	65.78 (10.97)	62.31 (11.11)	62.13 (13.34)	59.69 (12.35)	60.83 (15.10)	56.86 (11.65)
SSRS Social Skills Total[b]	84.16 (9.48)	86.10 (9.53)	83.79 (12.09)	89.43 (14.17)	93.69 (17.81)	94.85 (18.39)	93.20 (18.42)	97.52 (17.75)
PTRS-II Total[b]	4.14 (0.68)	4.05 (0.75)	4.21 (0.66)	4.27 (0.69)	4.43 (0.48)	4.53 (0.44)	4.41 (0.60)	4.41 (0.63)

Note: BASC-2: Behavior Assessment System for Children, 2nd edition; SSRS: Social Skills Rating System; PTRS-II: Parent-Teacher Relationship Scale-II.
[a] Dependent samples *t*-tests yielded significant differences ($p < .05$) between parent and teacher ratings at pre-test.
[b] Dependent samples *t*-tests yielded significant differences ($p < .001$) between parent and teacher ratings at pre-test.

Table 4
Fixed Effect Solution for Tests of CBC Effects on Teacher- and Parent-Reported Outcomes

	Teacher Evaluations						Parent Evaluations					
Effect	Est.	*SE*	DF	*t*	*p*	ES	Est.	*SE*	DF	*t*	*p*	ES
BASC-2 Externalizing Problems												
Intercept (C)	69.84	1.24	120	56.14	<.01		61.63	1.70	196	36.21	<.01	
Severity	2.56	0.50	178	5.13	<.01		–	–	–	–	–	
Age	–	–	–	–	–		−0.88	0.91	145	−0.67	.34	
Risk[2]	–	–	–	–	–		−2.48	1.24	142	−1.99	.05	
Disability status	–	–	–	–	–		6.60	2.02	139	3.27	<.01	
Time (C)	−2.27	1.08	163	−2.11	.04		−2.54	1.76	125	−1.44	.15	
Group (ΔE-C)	−4.43	1.68	123	−2.63	.01		−0.54	2.27	193	−0.24	.81	
Time∗Group (ΔE-C)	−1.62	1.45	164	−1.12	.41[1]	−0.18	−2.35	2.29	121	−1.03	.41[1]	−0.22
BASC-2 Adaptive Skills												
Intercept (C)	41.69	0.89	109	46.81	<.01		44.62	1.41	218	31.62	<.01	
Severity	−1.15	0.34	176	−3.34	<.01		–	–	–	–	–	
Age	–	–	–	–	–		0.06	0.72	152	0.09	.93	
Risk	–	–	–	–	–		2.16	0.98	147	2.20	.03	
Disability status	–	–	–	–	–		−4.77	1.59	142	−3.00	<.01	
Time (C)	0.75	0.69	162	1.10	.27		0.74	1.70	138	0.43	.67	
Group (ΔE-C)	−0.54	1.21	111	−0.45	.66		−0.77	1.87	216	−0.41	.68	
Time∗Group (ΔE-C)	2.15	0.92	160	2.34	.04[1]	0.39	−0.96	2.21	132	−0.44	.66[1]	−0.09
Social Skills Rating System Total Score												
Intercept (C)	84.29	1.47	115	57.23	<.01		94.47	2.20	174	42.85	<.01	
Severity	−2.42	0.50	179	−4.83	<.01		–	–	–	–	–	
Age	–	–	–	–	–		1.15	1.24	150	0.93	.35	
Risk	–	–	–	–	–		−0.10	1.74	149	−0.06	.96	
Disability status	–	–	–	–	–		−11.28	2.86	149	−3.94	<.01	
Time (C)	1.28	1.13	184	1.13	.26		0.54	1.48	132	0.37	.71	
Group (ΔE-C)	−.33	1.99	115	−0.17	.87		−0.63	3.00	174	−0.21	.83	
Time∗Group (ΔE-C)	4.69	1.53	184	3.07	.01[1]	0.47	4.78	1.99	132	2.41	.04[1]	0.42
Parent-Teacher Relationship Scale-II Total Score												
Intercept (C)	4.15	0.09	92.3	46.16	<.01		4.49	0.07	201	62.61	<.01	
Severity	−0.06	0.04	181	−1.77	.08		–	–	–	–	–	
Age	–	–	–	–	–		−0.02	0.04	160	−0.44	.66	
Risk	–	–	–	–	–		−0.01	0.05	149	−0.16	.87	
Disability status	–	–	–	–	–		0.07	0.09	149	0.78	.44	
Time (C)	−0.13	0.05	169	−2.46	.02		0.07	0.06	129	1.15	.25	
Group (ΔE-C)	0.004	0.12	93.9	0.03	.97		−0.12	0.10	203	−1.26	.21	
Time∗Group (ΔE-C)	0.21	0.07	170	3.10	.01[1]	0.47	−0.06	0.08	129	−0.81	.48[1]	−0.13

Notes: C = Control condition; E = Experimental (CBC) condition, BASC-2: Behavior Assessment System for Children, 2nd edition.

[1] All *p*-values reported for the Time∗Group (ΔE-C) interaction term are adjusted using the Benjamini-Hochberg method for controlling the FDR Benjamini & Hochberg, 1995). All other reported *p*-values are unadjusted.

[2] Risk is a cumulative index comprised of the total number of factors relevant for each participant from zero to four, based on the following factors (scored dichotomously): Language other than English spoken in the home; Maternal highest education less than high school diploma; Fewer than two adults in the home; Family income at 150% of the poverty threshold.

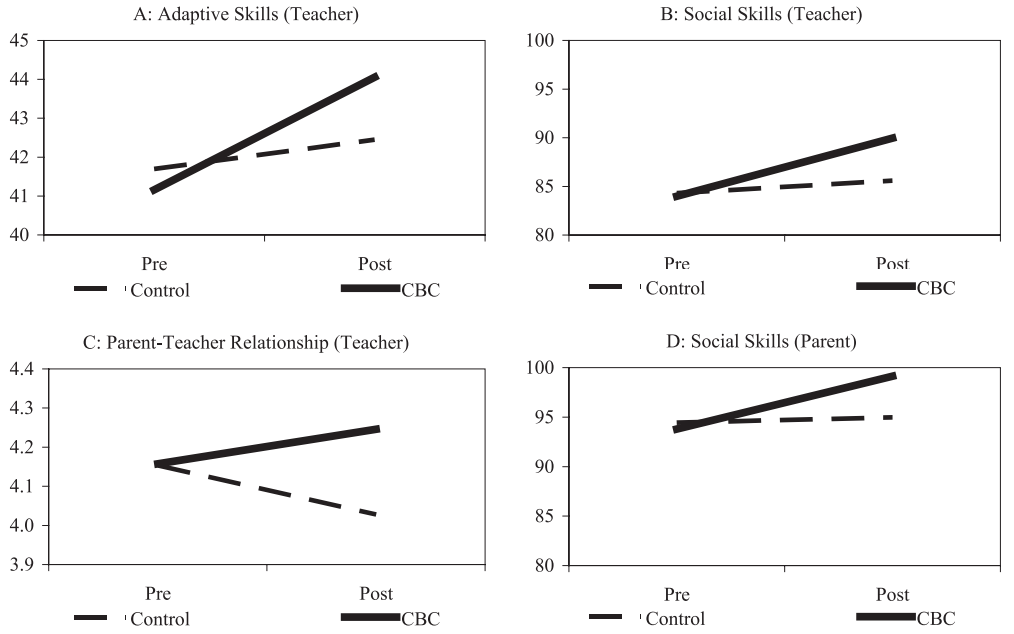

Figure 1. Estimated marginal means for teacher-reported outcomes of students' adaptive skills (A), social skills (B), and parent–teacher relationship (C), and parent-reported outcomes of students' social skills (D). CBC = conjoint behavioral consultation

Figure 1]. An effect size of $d_{RM} = 0.47$ suggests that the average teacher in the CBC condition reported equal or higher pre–post improvements in the parent–teacher relationship than 68% of teachers in the control group. However, there was no statistically significant difference between the CBC or control group on parents' reports of their relationship with teachers. None of the covariates was related to parents' report of their relationships with teachers.

Parent–Teacher Relationships as a Mediator of CBC on Child Outcomes

Direct effects of the CBC intervention on teacher-reported adaptive skills, social skills, and perceptions of the parent–teacher relationship were established, permitting an evaluation of the role of teacher perceptions of the parent–teacher relationship as a mediator of CBC's effect on teacher-reported child outcomes. Although a significant direct effect of CBC on parent-reported social skills were found as well, the absence of a significant effect on parent-reported perceptions of the parent–teacher relationship prevented a further evaluation of a mediated effect. Using multilevel path analysis, significant indirect effects of CBC on child behavior outcomes through teacher report of their relationships with parents were found for both teacher-reported adaptive skills and social skills. The mediation model for adaptive skills demonstrated an excellent fit to the data (see Figure 2): $\chi^2(10) = 6.794$, $p = .75$, CFI > 0.99, RMSEA < 0.01. The indirect effect of CBC on adaptive skills through parent–teacher relationships was significant: indirect $B = .48$ ($\beta = .06$), $t = 2.41$, $p < .05$. Similarly, the mediation model for teacher-rated social skills on the SSRS demonstrated an excellent fit to the data (see Figure 2): $\chi^2(10) = 9.168$, $p = .52$, CFI > 0.99, RMSEA < 0.01. The indirect effect of CBC on teacher-reported social skills

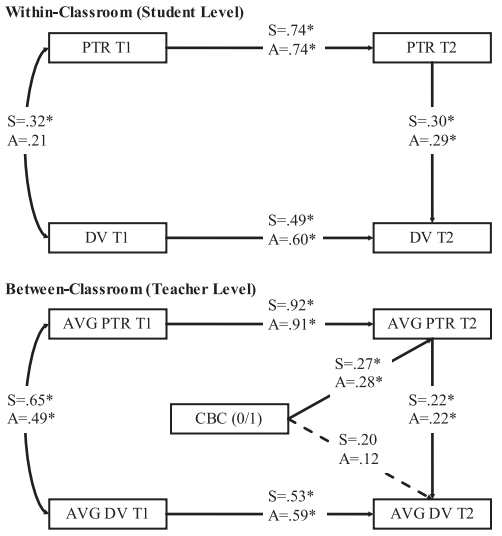

Figure 2. Multilevel path diagram and standardized solution of the indirect effect of assignment to CBC on teacher-rated DV as mediated through the teacher-rated PTR. CBC = conjoint behavioral consultation; S = social skills; A = adaptive skills; PTR = parent–teacher relationship; DV = child outcomes; AVG = average; T1 = Time 1; T2 = Time 2. The asterisk indicates statistical significance at the $p < .05$ level.

through parent–teacher relationships was significant: indirect $B = .83$ ($\beta = .06$), $t = 2.37$, $p < .05$. In both cases, the formerly significant direct relationship between CBC and child adaptive skills and social skills outcomes as reported in Table 4 became nonsignificant with the inclusion of the mediating variable, but they were still nonzero. This suggests that improvements in teacher-reported parent–teacher relationships may at least partially mediate the effect of CBC on children's increased adaptive skills and social skills as reported by teachers.

Acceptability of CBC

Acceptability of CBC was assessed to determine the practical perceptions of the consultation process by consumers, namely parents and teachers. On a scale of 1 (*low*) to 6 (*high*), parents and teachers reported CBC to be highly acceptable. Specifically, parents' mean item ratings on the BIRS Acceptability factor was 4.97 ($SD = 0.67$), and teachers averaged 5.08 ($SD = 0.78$) across items and respondents.

Discussion

Family–school partnerships are important in promoting desirable student behaviors and addressing behavioral concerns; however, interventions that build constructive partnerships have not been subject to extensive experimental research. Little research has uncovered efficacious methods for strengthening relationships between parents and teachers, and few studies have investigated the efficacy of family–school partnerships for promoting positive, adaptive behaviors at both home and at school. Previous CBC research has investigated these issues in part, but not in a comprehensive study such as this one. To date, empirical investigations have been limited to single-case designs, thereby focusing conclusions on a rather narrow set of questions and variables. Further, previous research has not been designed nor powered to determine how CBC operates to affect positive change, which provided neither theoretical nor practical contributions regarding which aspects of the intervention are responsible for desirable outcomes. As the first randomized trial evaluating the efficacy of CBC for promoting positive behavioral change and parent–teacher relationships, a great deal of control was imposed (e.g., the use of highly trained consultants, standardization of interventions). Scale-up efforts aimed at identifying effectiveness of the model in more authentic situations may be among the next along the trajectory of CBC outcome research.

The results of this study provide evidence for the efficacy of CBC in promoting positive behaviors in the primary grades. Compared to students in the control group, those receiving CBC demonstrated greater improvements in social skills as reported by both

parents and teachers over the 8-week intervention period. Furthermore, significantly greater improvements in adaptive skills were reported by teachers, relative to controls. Thus, the greatest effects were found on positive responses (prosocial skills and adaptive behaviors) intended to replace disruptive behaviors. The lack of significant decreases in externalizing behaviors is somewhat perplexing; however, it is noteworthy that in practice, CBC is a strength-based intervention focused on building behavioral and social competence in children (Sheridan & Kratochwill, 2008). Goals identified in CBC were focused on producing positive behaviors that are significantly related to academic outcomes even more so than negative behaviors (Kwon et al., in press). Thus, the positive effects on students' social and adaptive skills are not surprising, and in fact, highly encouraging.

Joint intervention effects across home and school were reported for CBC participants in the area of social skills. This supports previous research indicating the cumulative effect on children's development when supports are provided across multiple caregivers and systems (Crosnoe, Leventhal, Wirth, Pierce, & Pianta, 2010). Consistency across home and school (defined in terms of parallel supports provided to young children across settings), promotes positive developmental trajectories for children at risk, including those for whom academic progress has been limited (Rimm-Kaufman & Pianta, 2000) and for those living in low income conditions (Crosnoe et al., 2010; Hill, 2001). Whereas consistency across home and school may occur by chance or accident, CBC establishes continuity, defined as coordinated and planned interactions designed to encourage stimulation across home and school. From early studies, it is clear that students who experience discontinuity across their home, school, and peer worlds are at significant risk for decreased academic performance (Hansen, 1986) and mental health concerns (Phelan, Davidson, & Yu, 1998). CBC proactively structures continuities through the establishment of relationships and partnerships between home and school, exemplified through practices promoting shared ownership, mutual goal setting, joint planning, and cooperative plan implementation. In this study, cross-system problem solving and plan implementation produced positive, generalized social skills effects across ecological contexts in situations where behavioral challenges were already evident.

Despite continuities across home and school in promoting change in social skills, similarly common effects were not found for other behavioral indicators. Student behavior changes and differences between groups were greater in school settings than in homes. It is noteworthy that child behaviors reported by teachers in the school environment were rated as significantly more problematic at baseline than those reported by parents (see Table 3). Teachers perceived students' disruptive behaviors in the classroom to be more problematic, and their adaptive and social skills to be less appropriate, than did parents in the home. Teachers have perspectives of children's behaviors that are based on observations in contexts requiring greater levels of self-control and positive peer interaction than is typical in home settings. That parents' ratings were more moderate than teachers' lessens the opportunity to observe significant positive effects in ratings of students' behaviors outside of school. Additional research testing the efficacy of CBC for behaviors considered problematic to parents is necessary. Likewise, assessment of directly observed child behaviors at home and school would help clarify its efficacy on objective measures of behavior, irrespective of parent and teacher perceptions.

In intervention research, the fidelity with which treatment agents implement behavioral interventions is thought to affect outcomes. In the present study, more evidence of fidelity was available in school than home settings. Across both self-reports and permanent products, parents generally adhered to fewer intervention steps at home than teachers did at school. Specifically, parents reported adhering to close to 11% fewer plan objectives than teachers; products of the interventions revealed that approximately 9.5% fewer plan steps were delivered at home than at school. It is generally recognized that lessened adher-

ence to treatment plans undermines their effects (Hagermoser Sanetti & Kratochwill, 2009); however, the degree to which this difference in implementation across settings affected the potency of the intervention is unknown. Relatively lower implementation adherence presumably resulted in decreased dosage of the intervention overall (and especially at home), possibly compromising intervention effects. It is also possible that differences in implementation across settings (not just amount) was a source of relative discontinuity, which resulted in weakened intervention effects in the home setting where parents generally had less training and fewer supports. The degree to which treatment plan implementation moderates the effects of CBC is in need of future research attention.

Potential Implications for Theory

Since its inception, a goal of CBC has been the promotion of positive parent–teacher relationships. In theory, CBC has been purported to exert its influence through joint and collaborative efforts among parents and teachers. Compared to teachers in the control group, teachers in the CBC group reported greater increases in relationships with parents over the intervention period. Perusal of Figure 1 further depicts a decline in the parent–teacher relationship in the control condition. It is noteworthy that students in this study demonstrated significant behavioral concerns. Parents and teachers of these students often experience strained interpersonal relationships (Dishion & Stormshak, 2006). An exciting finding of the current study is the presence of a mediating effect of the parent–teacher relationship on children's prosocial outcomes. It was partially through the parent–teacher relationship, intentionally strengthened through the CBC process, that significant changes in prosocial behaviors are evidenced. That is, the presence of a positive, high-quality relationship between teachers and parents provides one plausible causal explanation for the significant child effects observed in this study. Other mechanisms also may be at play and contribute to CBC's outcomes, and these are worthy of future investigation. For example, improved parent and teacher strategy use, changes in behavioral contingencies, or continuity in practices across home and school may be other processes by which CBC affects student behavior change. This is highly significant, as it validates the critical role of parent–teacher relationships for promoting positive behaviors for students at risk.

CBC teachers, but not parents, reported significant change over time in their relationship with one another. It is possible that teachers were more keenly aware than parents of the improvement in their relationship as a function of working together in CBC. Teachers have the potential to interact with many parents in a given school year, and depending on their years of experience, they have a perspective of relationships based on interactions with potentially hundreds of parents over time. Thus, prior to CBC they may have reported on their relationship with parents in a way that generalizes across typical and routine situations. In the context of CBC, frequent contact and multiple opportunities for partnership-based interactions and relationship building with specific parents may heighten their unique relational experience for a given student. Parents of early elementary school children, on the other hand, have fewer previous experiences with teachers and may report perceptions of their relationship in a way that leaves little room for improvement. It is possible that the small-group format did not provide sufficient opportunity for parents to build a strong relationship with their children's teachers. It is also possible that there was a ceiling effect for parents, who entered the study with already relatively high perceptions of their relationship with teachers.

Limitations

The results of this study are significant for advancing our understanding of both the efficacy of CBC and mechanisms that partially account for positive child outcomes. However, certain limitations are apparent that warrant caution when interpreting the results. First, outcomes are based on teachers' and parents'

reports of children's behaviors rather than on direct observations in classrooms or other settings. Teachers were aware of group assignment and teachers in the treatment condition may have reported more positive changes given this knowledge. No differences between groups were noted on teacher or parent report of externalizing behaviors, which partially argues against Hawthorne or placebo effects. It may be that these findings are partly attributed to the method rather than the behavioral constructs of interest, and direct observational data are necessary to disentangle the degree to which our findings are a function of trait versus method variance.

In a similar fashion, measures of parent–teacher relationships are based on self-report only. There are currently no known direct behavioral measures of quality of parent–teacher relationships. It may be that the affective nature of this construct, based on personal interpretations of human experiences and cognitive events, precludes measurement using fully objective means. Related constructs that may contribute to one's experience of a relationship, such as communication frequencies and patterns, demonstrated engagement within parent–teacher interactions, degree of synchrony with one another and other partnership proxies are in need of investigation, to the extent that they may be able to be directly measured.

Third, limited information is available on the form and frequency of parent–teacher interactions for control group participants, or levels of involvement among parents in the control condition. An attention-control condition was not included to rule out the possible effect of simply attending meetings (vs. providing structured, conjoint problem solving consultation) in producing the effects found in this study. Future research that investigates alternative means of attending to parents is necessary to rule out the influence of simply spending time together or participating in group meetings.

Finally, the measurement of fidelity at home and school led to inconsistent information about adherence and dosage of intervention implementation, and virtually no information about quality (Dane & Schneider, 1998). Only 50% of parents submitted self-report data (vs. 75% of teachers). However, only 52% of teachers submitted permanent products (vs. 68% of parents). Although available data indicate high levels of implementation across multiple measures, the relatively low response rate of self-report and permanent product data may mask low levels of implementation. Because fidelity cannot be determined for measures that were not completed, estimates may be inflated.

Future Directions

The present findings yield several questions that are in need of continued investigation. Variables that moderate the effects of CBC on student outcomes should be studied to determine for whom and under what conditions CBC is effective. Variables at the level of the student (e.g., presence of disability, language, ethnicity), parent (e.g., education level, socioeconomic status), or teacher (e.g., years of experience, behavioral management skills) may affect these results and should be investigated. Likewise, psychological factors such as parents' beliefs in their role in education or self-efficacy, or teachers' beliefs and attitudes about parent involvement (Green, Walker, Hoover-Dempsey, & Sandler, 2007), may moderate the effects of CBC and are in need of investigation. Finally, certain contextual variables may moderate the effects of CBC, such as administrative support for parent involvement within schools, availability of resources such as behavioral specialists or consultants, and geographic locale including urban versus rural setting. Disentangling the degree to which these and other factors create conditions influencing the efficacy of CBC will be necessary as the model is brought to scale.

Results of the current study are encouraging, but indicate the effects of CBC after only an 8-week intervention. Evaluating maintenance of outcomes over time is necessary to understand the effect of conjoint consultation services in preventing the development of pervasive behavioral problems. Given the inten-

sity of the CBC process and its ability to address immediate concerns, data on the degree to which positive behaviors maintain into subsequent school years, at both home and within classroom settings, would be desirable. Similarly, the effects of CBC on other parent behaviors, such as participation in school events, home-based enrichment, home–school communication, and other practices are in need of investigation, as are teachers' and parents' ongoing beliefs and practices *vis á vis* parent–teacher relationships and partnerships. Replications of the current findings using randomized designs with different and demographically broader samples of students and families are necessary to increase confidence in CBC as an evidence-based intervention for addressing student concerns and promoting family–school partnerships.

References

Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin, 101,* 213–232.

Appleyard, K., Egeland, B., van Dulmen, M. H. M., & Sroufe, L. A. (2005). When more is not better: The role of cumulative risk in child behavior outcomes. *Journal of Child Psychology and Psychiatry, 46,* 235–245.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51,* 1173–1182.

Benjamini, Y., & Hochberg, Y. (1995). Controlling the false discovery rate: A practical and powerful approach to multiple testing. *Journal of the Royal Statistical Society, Series B, 57,* 289–300.

Bronfenbrenner, U. (1979). *The ecology of human development: Experimental by nature and design.* Cambridge, MA: Harvard University Press.

Caprara, G. V., Barbaranelli, C., Pastorelli, C., Bandura, A., & Zimbardo, P. G. (2000). Prosocial foundations of children's academic achievement. *Psychological Science, 11,* 302–306.

Christenson, S. L., & Sheridan, S. M. (2001). *Schools and families: Creating essential connections for learning.* New York: Guilford Press.

Clarke, B. L., Sheridan, S. M., & Woods, K. E. (2009). Elements of healthy school-family relationships. In S. Christenson & A. Reschly (Eds.), *Handbook of family-school partnerships* (pp. 61–79). New York: Routledge.

Crosnoe, R., Leventhal, T., Wirth, R. J., Pierce, K. M., & Pianta, R. C. (2010). Family socioeconomic status and consistent environmental stimulation in early childhood. *Child Development, 81,* 972–987.

Dane, A. V., & Schneider, B. H. (1998). Program integrity in primary and early secondary prevention: Are implementation effects out of control? *Clinical Psychology Review, 18,* 23–45.

Dishion, T. J., & Stormshak, E. A. (2006). *Intervening in children's lives: An ecological, family-centered approach to mental health care.* Washington, DC: American Psychological Association.

Elliott, S. N., & Von Brock Treuting, M. (1991). The Behavior Intervention Rating Scale: Development and validation of a pretreatment acceptability and effectiveness measure. *Journal of School Psychology, 29,* 43–51.

Freer, P., & Watson, T. S. (1999). A comparison of parent and teacher acceptability ratings of behavioral and conjoint behavioral consultation. *School Psychology Review, 28,* 672–684.

Galloway, J., & Sheridan, S. M. (1994). Implementing scientific practices through case studies: Examples using home-school interventions and consultation. *Journal of School Psychology, 32,* 385–413.

Gibbons, R. D., Hedeker, D. R., & Davis, J. M. (1993). Estimation of effect sizes from a series of experiments involving paired comparisons. *Journal of Educational Statistics, 18,* 271–279.

Green, C. L., Walker, J. M. T., Hoover-Dempsey, K. V., & Sandler, H. (2007). Parents' motivations for involvement in children's education: An empirical test of a theoretical model of parental involvement. *Journal of Educational Psychology, 99,* 532–544.

Gresham, F. M., & Elliott, S. N. (1990). *The social skills rating system.* Circle Pines, MN: American Guidance Services.

Guli, L. A. (2005). Evidence-based parent consultation with school-related outcomes. *School Psychology Quarterly, 20,* 455–472.

Hagermoser Sanetti, L. M., & Kratochwill, T. R. (2009). Toward developing a science of treatment integrity: Introduction to the special series. *School Psychology Review, 38,* 445–459.

Hansen, D. A. (1986). Family-school articulations: The effects of interaction rule mismatch. *American Educational Research Journal, 23,* 643–659.

Hill, N. E. (2001). Parenting and academic socialization as they relate to school readiness: The roles of ethnicity and family income. *Journal of Educational Psychology, 93,* 686–697.

Jenson, W. R., Rhode, G., & Neville, M. A. (2010). *The tough kid parent book.* Eugene, OR: Pacific Northwest Publishing.

Jenson, W. R., Rhode, G., & Reavis, H. K. (2010). *The tough kid tool box.* Eugene, OR: Pacific Northwest Publishing.

Keenan, K., & Wakschlag, L. (2000). More than the terrible twos: The nature and severity of behavior problems in clinic-referred preschool children. *Journal of Abnormal Child Psychology, 28,* 33–46.

Kenward, M. G., & Rogers, J. H. (1997). Small sample inference for fixed effects from restricted maximum likelihood. *Biometrics, 53,* 983–997.

Kwon, K., Kim, E. M., & Sheridan, S. M. (in press). Behavioral competence and academic functioning among early elementary children with externalizing problems.

Lasecki, K., Olympia, D., Clark, E., Jenson, W., & Heathfield, L. (2008). Using behavioral interventions to as-

sist children with type 1 diabetes manage blood glucose levels. *School Psychology Quarterly, 23,* 389–406.

McCain, A. P., & Kelley, M. L. (1994). Improving classroom performance in underachieving preadolescents: The additive effects of response cost to a school-home note system. *Child & Family Behavior Therapy, 16,* 27–41.

McCombs Thomas, A., Forehand, R., Armistead, L., Wierson, M., & Fauber, R. (1990). Cross-informant consistency in externalizing and internalizing problems in early adolescence. *Journal of Psychopathology and Behavioral Assessment, 12,* 255–262.

McMahon, R. J., & Forehand, R. L. (2003). *Helping the noncompliant child* (2nd ed.). New York: Guilford Press.

Moore, L. A., Waguespack, A. M., Wickstrom, K. F., Witt, J. C., & Gaydon, G. R. (1994). Mystery motivator: An effective and time efficient intervention. *School Psychology Review, 23,* 106–117.

Morris, S. B., & DeShon, R. P. (2002). Combining effect size estimates in meta-analysis with repeated measures and independent-groups design. *Psychological Methods, 7,* 105–125.

Musser, E. H., Bray, M. A., Kehle, T. J., & Jenson, W. J. (2001). Reducing disruptive behaviors in students with serious emotional disturbance. *School Psychology Review, 30,* 294–304.

Offord, D., & Bennett, K. (1994). Conduct disorder: Long-term outcomes and intervention effectiveness. *Journal of American Child and Adolescent Psychiatry, 33,* 1069–1078.

Perepletchikova, F., Treat, T. A., & Kazdin, A. E. (2007). Treatment integrity in psychotherapy research: Analysis of the studies and examination of the associated factors. *Journal of Consulting and Clinical Psychology, 75,* 829–841.

Pfiffner, L., & McBurnett, K. (1997). Social skills training with parent generalization, treatment effects for children with attention deficit disorder. *Journal of Consulting and Clinical Psychology*, *65,* 749–757.

Phelan, P., Davidson, A. L., & Yu, H. C. (1998). *Adolescents' worlds: Negotiating family, peers, and schools.* New York: Teachers College Press.

Preacher, K. J., Zyphur, M. J., & Zhang, Z. (2010). A general SEM framework for assessing multilevel mediation. *Psychological Methods, 15,* 209–233.

Rathvon, N. (2008). *Effective school interventions: Second edition: Evidence-based strategies for improving student outcomes.* New York: Guilford Press.

Raudenbush, S. W., & Bryk, A. S. (2002). *Hierarchical linear models: Applications and data analysis methods* (2nd ed.). Thousand Oaks, CA: Sage.

Reynolds, C. R., & Kamphaus, R. W. (2004). *Behavior Assessment System for Children, Second Edition (BASC-2).* Circle Pines, MN: AGS Publishing.

Rhode, G., Jenson, W. R., & Reavis, H. K. (1992). *The tough kid book: Practical classroom management strategies.* Longmont, CO: Sopris West.

Rimm-Kaufman, S. E., & Pianta, R. C. (2000). An ecological perspective on the transition to kindergarten: A theoretical framework to guide empirical research. *Journal of Applied Developmental Psychology, 21,* 491–511.

Rose, S. L., Rose, S. A., & Feldman, J. F. (1989). Stability of behavior problems in young children. *Development and Psychopathology, 1,* 5–19.

Schochet, P. Z. (2009). An approach for addressing the multiple testing problem in social policy impact evaluations. *Evaluation Review, 33,* 539–567.

Sheridan, S. M. (2010). *The tough kid social skills book.* Eugene, OR: Pacific Northwest Publishing.

Sheridan, S. M., Clarke, B. L., & Burt, J. D. (2008). Conjoint behavioral consultation: What do we know and what do we need to know? In W. P. Erchul & S. M. Sheridan (Eds.), *Handbook of research in school consultation: Empirical foundations for the field* (pp. 171–202). Mahwah, NJ: Lawrence Erlbaum.

Sheridan, S. M., Clarke, B. L., Knoche, L. L., & Edwards, C. P. (2006). The effects of conjoint behavioral consultation in early childhood settings. *Early Education and Development, 17,* 593–618.

Sheridan, S. M., & Colton, D. L. (1994). Conjoint behavioral consultation: A review and case study. *Journal of Educational and Psychological Consultation, 5,* 211–228.

Sheridan, S. M., Eagle, J. W., Cowan, R. J., & Mickelson, W. (2001). The effects of conjoint behavioral consultation: Results of a four-year investigation. *Journal of School Psychology, 39,* 361–385.

Sheridan, S. M., & Kratochwill, T. R. (2008). *Conjoint behavioral consultation: Promoting family-school connections and interventions.* New York: Springer.

Sheridan, S. M., Kratochwill, T. R., & Bergan, J. R. (1996). *Conjoint behavioral consultation: A procedural manual.* New York: Plenum.

Sheridan, S. M., Kratochwill, T. R., & Elliott, S. N. (1990). Behavioral consultation with parents and teachers: Delivering treatment for socially withdrawn children at home and school. *School Psychology Review, 19,* 33–52.

Sheridan, S. M., & Steck, M. (1995). Acceptability of conjoint behavioral consultation: A national survey of school psychologists. *School Psychology Review, 24,* 633–647.

Sheridan, S. M., Swanger-Gagne, M. S., Welch, G. W., Kwon, K., & Garbacz, S. A. (2009). Fidelity measurement in consultation: Psychometric issues and preliminary examination. *School Psychology Review, 38,* 476–495.

Sheridan, S. M., Warnes, E. D., Woods, K. E., Blevins, C. A., Magee, K. L., & Ellis, C. (2009). An exploratory evaluation of conjoint behavioral consultation to promote collaboration among family, school, and pediatric systems: A role for pediatric school psychologists. *Journal of Educational and Psychological Consultation, 19,* 106–129.

Singer, J. D. (1998). Using SAS PROC MIXED to fit multilevel models, hierarchical models, and individual growth models. *Journal of Educational and Behavioral Statistics, 24,* 323–355.

Snijders, T., & Bosker, R. (1999). *Multilevel analysis: An introduction to basic and advanced multilevel modeling.* London, England: Sage.

Swanger-Gagne, M. S., Garbacz, S. A., & Sheridan, S. M. (2009). Intervention implementation integrity within conjoint behavioral consultation: Strategies for working with families. *School Mental Health, 1,* 131–142.

Taylor, T. K., & Biglan, A. (1998). Behavioural family interventions for improving child rearing: A review for

clinicians and policy makers. *Clinical Child and Family Psychology Review, 1,* 41–60.

Vickers, H. S., & Minke, K. M. (1995). Exploring parent-teacher relationships: Joining and communication to others. *School Psychology Quarterly, 10,* 133–150.

Volpe, R. J., DuPaul, G. J., DiPerna, J. C., Jitendra, A. I., Lutz, J. G., Tresco, K., et al. (2006). Attention deficit hyperactivity disorder and scholastic achievement: A model of mediation via academic enablers. *School Psychology Review, 35,* 47–61.

Walker, H. M., & Severson, H. H. (1990). *Systematic screening for behavior disorders (SSBD): User's guide and administration manual.* Longmont, CO: Sopris West.

Weiner, R., Sheridan, S. M., & Jenson, W. R. (1998). Effects of conjoint behavioral consultation and a structured homework program on math completion and accuracy in junior high students. *School Psychology Quarterly, 13,* 281–309.

Westfall, P., Tobias, R., Rom, D., Wolfinger, R., & Hochberg, Y. (1999). *Multiple comparisons and multiple tests using SAS.* Carey, NC: SAS Press.

Wilkinson, L. A. (2005). An evaluation of conjoint behavioral consultation as a model for supporting students with emotional and behavioral difficulties in mainstream classrooms. *Emotional and Behavioural Difficulties, 10,* 119–136.

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