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## The Efficacy and Mechanisms of Conjoint Behavioral Consultation

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# RURAL TEACHER PRACTICES AND PARTNERSHIPS TO ADDRESS BEHAVIORAL CHALLENGES

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## *The Efficacy and Mechanisms of Conjoint Behavioral Consultation*

### ABSTRACT

The efficacy of conjoint behavioral consultation (CBC), a family-school partnership intervention, for teachers' practices and process skills was evaluated. Participants were 152 teachers of grades K–3 in 45 Midwest rural schools randomly assigned to treatment or control conditions. Treatment group teachers participated in an 8- to 10-week CBC intervention. Outcome measures were (a) self-reports of classroom practices and collaborative process skills and (b) direct observations of teachers' use of effective behavioral strategies. Relative to control group participants, there was a significant positive intervention effect on CBC teachers' self-report of appropriate behavioral strategies ( $\beta = .47, p < .001$ ), observations of their use of positive attention ( $\beta = .50, p < .001$ ) and positive consequences ( $\beta = .72, p < .001$ ), and competence in addressing problems ( $\beta = .95, p < .001$ ). Teachers' appropriate strategy use was mediated by their use of problem-solving processes. Implications for rural settings are discussed.

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**T** **EACHERS** often are considered the linchpin for promoting the educational success of students. Although they are generally well equipped with knowledge and skills needed to support the academic success of most typically functioning students, general education teachers are not always prepared to address the needs of students who struggle in the classroom (Carter & Van Norman, 2010; Dufrene, Lestremau, & Zoder-Martell, 2014; Dufrene et al., 2012). This lack of preparation can be especially evident when teachers interact with students exhibiting behavioral problems, which often disrupt classrooms and challenge learning interactions. To promote success for students who struggle behaviorally, teachers need effective strategies to address disruptive, challenging behaviors and promote appropriate social-behavioral skills for students in their classrooms.

The contexts within which children live have notable impact on their academic and social-behavioral development. In addition to immediate (e.g., home, school) settings, distal variables (e.g., community locale) impact academic opportunities (Clarke, Koziol, & Sheridan, 2017), behavioral functioning (Sheridan, Koziol, Clarke, Rispoli, & Coutts, 2014), and student outcomes (Miller, Votruba-Drzal, & Setodji, 2013).<sup>1</sup> However, much of what is known about educational practices and outcomes is based on research conducted in densely populated, urban settings. Growing up in rural communities and attending rural schools present distinct experiences that can both protect (e.g., stable networks, small class size) and challenge (e.g., fewer services, lower economic base) developmental and learning trajectories (Mokrova, Vernon-Feagans, & Garrett-Peters, 2017). More than one in four of America's public schools is rural, and nearly one in six of the nation's students lives in a rural area.

The rural context creates a unique set of challenges for the educators responsible for the nearly 9 million students who attend rural schools in the United States (Showalter, Klein, Johnson, & Hartman, 2017). Relative to nonrural settings, teachers in rural communities are geographically isolated and have limited access to professional development supports and resources (McClure & Reeves, 2004; Monk, 2007; Sheridan, Kunz, Holmes, & Witte, 2017). Furthermore, students in rural schools have been shown to display higher rates of behavioral problems than students in nonrural schools (Sheridan, Koziol, et al., 2014), yet there are limited support services available in rural communities (DeLeon, Wakefield, & Hagglund, 2003). Enhancing the availability of and access to supports for teachers in rural schools represents one means of augmenting the quality of education in underserved rural communities (Barley & Beesley, 2007; Lowe, 2006).

## Supporting Rural Teachers

The efficacy of interventions designed to support teacher instructional practices in rural schools is gaining empirical attention (Glover, 2017; Marsicano, Morrison, Moomaw, Fite, & Kluesener, 2015; Nugent, Kunz, Houston, Kalutskaya, & Pedersen, 2017; Vernon-Feagans, Kainz, Hedrick, Ginsberg, & Amendum, 2013). However, few studies have investigated their effects on social-behavioral problems in rural schools.

Behavioral consultation is an individualized problem-solving process in which a consultant (trained specialist such as a school psychologist or counselor with expertise in problem solving and interventions) and a consultee (e.g., teacher) work to enhance students' behavioral outcomes through a systematic, stagewise progression. Effective implementation of the four-stage consultation process results in the identification of a student's need (target behavior), determination of baseline levels of performance and behavioral function, specification of a behavioral goal, development and implementation of an intervention to address the target behavior, evaluation of the outcome of the intervention, and modification of the intervention as necessary to achieve goal attainment (Bergan & Kratochwill, 1990).

School-based behavioral consultation has long been considered an effective intervention for enhancing student outcomes indirectly by modifying the manner in which teachers interact with students (Dunson, Hughes, & Jackson, 1994; Kratochwill, Elliott, & Busse, 1995; Sheridan, Welch, & Orme, 1996). Specifically, consultation-based interventions are expected to enhance teachers' skills and practices for effectively intervening with students to augment their learning and behavioral outcomes. For decades, psychologists have noted the ultimate goal to "give psychology away" (Miller, 1969; Zimbardo, 2004), thereby enabling adults who are responsible for children's care to use effective techniques in standard and routine practice. Consultation services provide the opportunity to do so, in that caregivers (teachers, parents) can learn a systematic process for understanding and solving problems and techniques to address them in their interactions with students. That is, school-based consultation is expected to enhance teachers' use of effective classroom practices and teachers' process skills that improve their ability to approach and solve problems.

Behavioral consultation studies using single-case experimental designs have demonstrated improvements in teacher behaviors (Hagermoser Sanetti, Collier-Meek, Long, Byron, & Kratochwill, 2015; McKenney, Waldron, & Conroy, 2013) and academic instructional practices (Dufrene et al., 2012; Marsicano et al., 2015). Despite the utility of consultation on teachers' strategy use, limited generalization in teachers' abilities to apply behavioral strategies learned through consultation has been observed (Duncan, Dufrene, Sterling, & Tingstrom, 2013; Riley-Tillman & Eckert, 2001). Understanding how consultation works to support teachers' improved skills and practices may help ensure generalization to new students or behavioral challenges. Some early descriptive studies have suggested that consultation supports teachers' process skills associated with problem solving (specifically, understanding how to approach problem behaviors and make data-based decisions regarding appropriate strategies and monitoring students' responses; Kaiser, Rosenfield, & Gravois, 2009; Zins & Ponti, 1996). It is possible that teachers' development and use of problem-solving skills (i.e., learning to identify and define target behaviors, understand function, develop effective behavioral plans, and monitor student progress) may enhance their ability to acquire and generalize effective behavioral strategies for use in the classroom. That is, the effects of consultation on teachers' use of effective classroom practices may be possible through the systematic problem-solving skills they acquire as a function of consultation. However, this assumption has not been demonstrated empirically.

## Family-School Partnerships in Rural Schools

Another potential source of teacher support in rural school settings is families. Family-school partnerships in educational interventions have been found to be very useful for students with, or at risk for developing, behavioral problems in rural (Sheridan, Witte, Holmes, Coutts, et al., 2017; Sheridan, Witte, Holmes, Wu, et al., 2017) and nonrural (Fan & Chen, 2001) settings. Experimental studies with families as collaborators have shown improved behavioral functioning and diminished disruptive behaviors for students in treatment relative to control groups (Israel, Soltar, & Zimand, 1990; Sheridan et al., 2012).

Unfortunately, high-quality relationships between rural families and schools and meaningful involvement of rural family members in educational decision making are often limited. Teachers in rural schools report a lack of training in communicating effectively with parents (Agbo, 2007), which is a foundational aspect of partnerships (Christenson & Sheridan, 2001). Rural parents have been found to attend fewer school meetings and interact with teachers less frequently relative to their counterparts in suburban and urban schools (Prater, Bermudez, & Owens, 1997). Furthermore, almost half of rural parents surveyed reported being dissatisfied in their interactions with school staff (Herrold & O'Donnell, 2008). To the extent that parents can provide human capital and be a valuable educational resource to rural schools, methods for equipping rural teachers with knowledge and skills to effectively communicate with parents and develop collaborative partnerships are necessary (Ratcliff & Hunt, 2009; Souto-Manning & Swick, 2006).

## Conjoint Behavioral Consultation

One approach that supports teachers in promoting family-school partnerships while addressing their students' needs is conjoint behavioral consultation (CBC; Sheridan & Kratochwill, 2008). CBC is defined as "a strength-based, cross-system problem-solving and decision-making model wherein parents [and] teachers . . . work as partners and share responsibility for promoting positive and consistent outcomes related to a child's academic, behavioral, and social-emotional development" (Sheridan & Kratochwill, 2008, p. 25). The CBC intervention aims to reduce child behavior problems, increase child academic and adaptive skills, and enhance family-school partnerships specifically by promoting effective classroom practices (behavioral management) and process (problem solving and communication) skills. Designed for students who need additional support beyond building-level and class-wide behavior management systems, it is conducted through individualized collaborative interactions (CBC meetings) between parents and teachers, promoting consistent implementation of effective behavioral strategies across home and school settings.

CBC typically includes three to four meetings over 8 to 12 weeks. With the assistance of a consultant who guides the structured, collaborative problem-solving process, parents and teachers (*a*) define behavioral challenges that interfere with a student's learning and establish methods to collect data (Meeting 1: identification); (*b*) codevelop a cross-setting behavioral plan with behavioral strategies and plan tactics to be implemented across home and school (Meeting 2: plan development

and plan implementation); and (c) evaluate the student’s progress toward goals and need to modify, extend, or fade the behavioral plan (Meetings 3 and 4, as necessary; plan evaluation). Table 1 provides a description of CBC stages and objectives.

Decades of research consistently demonstrate that CBC fosters family-school partnerships and ameliorates student academic and behavioral problems (Sheridan, Clarke, & Ransom, 2014). Previous single-subject methodology studies support the effectiveness of CBC across a wide array of student outcomes for typically developing students (e.g., Galloway & Sheridan, 1994; Ohmstede & Yetter, 2015) and students identified with special needs (e.g., Colton & Sheridan, 1998; Garbacz & McIntyre, 2016).

In large-scale randomized trials conducted in urban and suburban settings, students who received CBC demonstrated greater rates of improvements in adaptive behaviors (e.g., social skills, leadership skills, and study skills) relative to the control group (Sheridan et al., 2012), and parents who received CBC significantly outpaced controls in the quality of the family-school relationship (Power et al., 2012; Sheridan, Ryoo, Garbacz, Kunz, & Chumney, 2013). Furthermore, teachers who received CBC reported significantly greater rates of improvement in their relationships with parents than did teachers in the control group, and the teacher-parent relationship mediated the effects of CBC on students’ adaptive and social skills (Sheridan et al., 2012). Similar results were found in rural communities, where CBC has been found to improve students’ teacher-reported school problems and observational measures

Table 1. Conjoint Behavioral Consultation Program Elements and Objectives

Element	Objective
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 interview (“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
Plan evaluation interview (“checking and reconnecting”)	Assess immediate changes in student’s behavior
	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

Source.—Sheridan et al. (2012), reprinted with permission.

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 that teacher’s classroom, and a consultant.

of their inappropriate (off-task and motor activity) and appropriate (on-task and social interactions) classroom behavior relative to the control group (Sheridan, Witte, Holmes, Coutts, et al., 2017). In addition, significantly different rates of improvement in the teacher-parent relationship in favor of the CBC group have been noted (Sheridan, Witte, Holmes, Coutts, et al., 2017; Sheridan, Witte, Holmes, Wu, et al., 2017), with the teacher-parent relationship found to partially mediate the effects of CBC on student behaviors (Sheridan et al., 2012; Sheridan, Witte, Holmes, Coutts, et al., 2017; Sheridan, Witte, Holmes, Wu, et al., 2017).

Despite all we know about the effects of CBC on students, parents, and parent-teacher relationships, there is a critical gap in knowledge related to the impact of CBC on teachers' use of behavioral strategies and collaborative process skills. To date, empirical support for the efficacy of CBC at promoting effective teacher practices (behavioral strategy use) and collaborative process skills (problem solving and quality communication with parents) has not been investigated. Furthermore, the mechanisms by which CBC enhances teachers' practices are unknown.

The purpose of the current study was to examine the efficacy of CBC on rural teachers' (kindergarten through third grade) classroom practices (behavioral strategy use) and collaborative process skills (problem-solving competence, communication quality). Likewise, the degree to which collaborative processes mediated the effects of CBC on rural teachers' strategy use was investigated. Our research questions were, (a) What are the effects of CBC on rural teachers' practices (use of effective behavioral strategies) to address individual students' behavioral challenges? (b) What are the effects of CBC on rural teachers' collaborative process skills (competence in problem solving, communication quality with parents) to address individual students' behavioral challenges? (c) Do teachers' collaborative process skills (competence in problem solving, communication quality with parents) mediate the effects of CBC on their classroom practices (use of effective behavioral strategies)?

## Method

This study was conducted as part of a randomized controlled trial evaluating the efficacy of CBC on students' social and behavioral functioning in rural schools for students in grades K–3. Study results for student performance at school and for student and parent outcomes in home settings are reported elsewhere (Sheridan, Witte, Holmes, Coutts, et al., 2017; Sheridan, Witte, Holmes, Wu, et al., 2017).

### Participants

Participants in this study were 152 teachers (84 treatment, 68 control) of grades K–3 in rural schools (number of teachers per school,  $M = 3.23$ ,  $SD = 2.19$ ). Most (97%) were female, and 100% were White/non-Hispanic. The average age of teachers was 41.22 years ( $SD = 12.6$ ). Approximately one fourth (26%) held a bachelor's degree, one third (32%) had an advanced graduate degree, and 42% had completed some graduate coursework. Teachers' years of experience averaged 15.30 ( $SD = 11.31$ ).

Once teachers enrolled in the study, they were asked to identify up to five students in their classroom with disruptive behaviors that interfered with learning

to create a pool of potential student participants. Teachers completed a checklist assessing frequency and severity of disruptive behaviors (1 = *low*, 7 = *high*) and the need for additional intervention (1 = *low*, 9 = *extreme*). Students were considered for inclusion in the study if they were (a) reported by teachers as exhibiting behavioral problems rated as moderate to extreme in severity and frequency and (b) noted to have challenges that warranted moderate to significant need for additional services (Sheridan et al., 2012). Parents of students who met these criteria were contacted by school personnel who explained the study and gained verbal permission for the researchers to contact them. A member of the research team contacted parents who responded affirmatively, explained the details of the study, and gained informed consent for participation. In all, there were 159 student participants in the treatment group and 108 in the control group (see Sheridan, Witte, Holmes, Coutts, et al., 2017). The mean number of participating students per teacher was 1.76 ( $SD = .73$ ).

CBC casework was led by 14 master's-level, trained consultants with degrees in educational administration, special education, school psychology, or counseling psychology. All but one were female, all were White/non-Hispanic, and the average age was 29.63 years ( $SD = 5.97$ ). Prior to initiating work with teachers and parents, consultants completed a 4-week, 64-hour training program including assigned readings on CBC and evidence-based behavioral interventions, video modeling, role playing, performance feedback, and self-monitoring. All consultants received ongoing individualized and group supervision throughout the study.

### Setting

Commensurate with the number of teachers, 152 classrooms (84 treatment, 68 control) in 45 rural schools across three midwestern states composed the setting for this study. Almost all (96%) were in one state in which 55% of schools are considered rural and 85% of school districts are considered small. In this study, 84% of schools were considered "rural" or "remote town," and 15% were in other "town" classifications based on the National Center for Education Statistics classification scheme. The average class size was 18 students ( $SD = 4.52$ ).<sup>2</sup>

### Procedure

**Experimental conditions.** CBC (Sheridan & Kratochwill, 2008) was the primary intervention under investigation, with implementation occurring in a series of four consultation meetings involving teachers, parents, and project-based CBC consultants over approximately 8 weeks.<sup>3</sup> All meetings were held in teachers' classrooms or another room at the school for 45–90 minutes. The objectives of each interview are listed in Table 1. Between-session supports were also provided by consultants, wherein modeling of interventions and troubleshooting occurred. The first structured CBC interview (based on Sheridan & Kratochwill, 2008) was the needs identification/analysis ("building on strengths") interview. The primary purposes of this interview were to identify specific disruptive behaviors that interfered with students' learning and specify appropriate behavioral goals for students. The second meeting, occurring approximately 1 week following the initial meeting, was the plan



development and implementation (“planning for success”) interview. The primary objective involved the consultant, teacher, and parent to co-construct intervention plans to address students’ target concerns. All classroom intervention plans developed during this stage included the delivery of positive consequences (e.g., praise, concrete reinforcers) to address student behavior. In the period elapsing between the second and third meetings, consultants provided implementation support to the teacher and the parent. This involved classroom observations of teachers’ plan implementation, feedback regarding specific plan tactics, and troubleshooting difficulties experienced by teachers in executing behavioral strategies.<sup>4</sup> After plans had been put into place for approximately 2 weeks, the team convened again for the plan evaluation (“checking and reconnecting”) interview. This interview focused on evaluating the effectiveness of the intervention plan(s) for achieving students’ behavioral goals, determining needs for plan modification, or discontinuation of consultation.

*Business as usual* was defined as traditional school supports provided to teachers within the school for addressing behavioral problems in their classrooms. Sixty-two percent of school principals responded to a survey; of those, 61% indicated they had a school-wide program for promoting positive and addressing negative behavior (e.g., office referrals, think time/removal from classroom, suspensions). Slightly more than one third (36%) stated that within the past year, their teachers received training in methods for promoting positive and decreasing negative behaviors. Fifty percent stated that they have a school-wide process for promoting home-school partnerships, and 18% indicated that their teachers received training on that topic within the past year.

**Fidelity of CBC.** Fidelity (adherence and quality) of the CBC interviews was assessed using structured coding matrices on which the primary CBC objectives were listed, and scores were assigned by independent trained coders (Holmes et al., 2013; Kunz, Bieber, Witte, Chapla, & Sheridan, 2011). Consultants’ adherence to each CBC interview objective was scored dichotomously (0 = *objective not met*, 1 = *objective met*), and an overall adherence percentage was computed by dividing the number of specific objectives that the consultant met by the total possible objectives per interview. The effectiveness (i.e., quality) with which CBC was delivered was also measured for each of the interview objectives on a 3-point Likert scale of 0 (*not effective*), 1 (*moderately effective*), and 2 (*highly effective*). Coders listened to approximately 25% ( $n = 82$ ) of all interviews, selected randomly to represent each stage of CBC.

**Data collection.** Self-report surveys assessing both teacher practices and collaborative process skills were administered on two occasions: once at preintervention (Time 1 [T1]) and once postintervention (12 weeks later; Time 2 [T2]). Surveys for control group participants were administered at time points similar to those collected from the intervention participants in their schools.

Thirty-minute direct observations were conducted by trained observers blind to participants’ condition. Observers used 20-second partial interval recording procedures to capture teacher classroom behaviors, wherein a relevant behavior observed at any time within the 20-second interval was recorded as occurring. Training entailed a standard protocol involving readings on definitional codes and best practices, observation procedures, and structured practice and feedback on video

coding. Observers were required to complete two consecutive 30-minute observations on which they achieved .85 or higher agreement for each behavior with a master coder. They also completed (at 85% or higher) a competency-based assessment of knowledge of observation procedures, best practices, and behavioral codes.

For the first 3 years of the study, observations were conducted live in classrooms. In later years, video recorders were used to gather videos of classrooms and were coded at a later time. For intervention group participants, observations were conducted once weekly, four times preintervention and four times during or postintervention. For control group participants, observations were conducted weekly for 8 weeks, beginning at a similar time point as intervention group participants. Interrater agreement of classroom observations was calculated with Cohen's kappa, a robust measure for categorical data because it accounts for agreement occurring by chance. Average kappa values across behavioral codes ranged from .84 to .98. There was no difference in interrater agreement based on modality (live or recorded).

## Measures

**Teacher classroom practices.** Teachers' classroom practices (use of effective behavioral strategies) were assessed via two methods: self-report and direct observation. The Teacher Strategies Questionnaire (TSQ; Webster-Stratton, 2005) was used to assess teachers' frequency of strategy implementation. The TSQ includes two subscales, appropriate strategy use (21 items) and inappropriate strategy use (nine items), on which teachers rated the frequency of their use of strategies on a 5-point scale: 1 (*rarely/never*), 2 (*somewhat*), 3 (*half the time*), 4 (*often*), and 5 (*very often*). Alpha coefficients at T1 and T2 for the appropriate strategies were .82 and .84, respectively. For inappropriate strategies, alphas were .61 and .65 for T1 and T2, respectively.

Direct observations of teacher classroom practices were conducted weekly during a predetermined target time when student behaviors were expected to indicate the need for intervention. A 30-minute partial interval recording method was used to observe five teacher behaviors: delivery of positive attention, providing positive tangible consequences, use of effective command, providing negative attention, and use of reductive techniques (see Table 2 for definitions).

**Teacher process skills.** Two sets of process skills were assessed. Teacher competence in problem solving was assessed with the Teacher Competence in Problem Solving Scale (TCPS; Sheridan, Witte, Holmes, Coutts, et al., 2017), an eight-item self-report measure used to assess teachers' abilities to effectively solve problems related to students' learning and behaviors from 1 (*disagree very strongly*) to 6 (*agree very strongly*; see Table 3). The alpha estimate for the TCPS in the current study was .94 at T1 and .97 at T2.

Communication with parents was measured with the Communication Quality Scale (CQS), derived from a confirmatory factor analysis of the Consultation Engagement Scale (Mullaney et al., 2009). The two-factor confirmatory factor analysis model containing all of the original 16 items from the Consultation Engagement Scale adequately fit the data,  $\chi^2(100) = 220.49$ , RMSEA = .07, 90% confidence interval [.06, .08], comparative fit index = .90, with standardized factor loadings

Table 2. Teacher Practices and Operational Definitions

Teacher Practice	Definition
Provide positive tangible consequence	All instances in which the teacher provides the target student with a tangible reward (e.g., stickers, points, toys) or special privileges (e.g., computer time, line leader)
Effective command	A command, issued by the teacher to the target student, related to the content and form of social interactions, personal conduct, and/or school/classroom rules of behavior, which meets the following criteria: <ul style="list-style-type: none"> <li>• Includes only positively framed statements, or prompts that require the student to perform an observable behavior</li> <li>• Is precise, specific, and direct, with a clearly defined desired outcome</li> <li>• Is given using a calm, neutral/firm tone</li> <li>• Is within 3 ft or arm's length of the student and looking at the student</li> <li>• If a repeat is given, the teacher waits at least 5 s after giving the initial command before repeating the command</li> </ul>
Positive attention	Positive verbal statements (e.g., verbal praise), positive nonverbal gestures (e.g., nodding encouragingly, smiling, giving the thumbs-up sign), and/or positive physical contact (e.g., pat on the back, high five) directed to the target student
Use of reductive technique	The teacher withdraws privileges, opportunities for social interaction or other types of reinforcement, points or tangible items/objects from the student or isolates the student from the class (e.g., time-out/safe seat, send child to the office). Can include using physical restraint
Negative attention	Negative verbal statements (e.g., reprimands, warnings/threats, disapproval), negative nonverbal gestures (e.g., frowning, glaring), and/or negative physical contact (e.g., hitting, slapping, poking, jerking) directed to the target student

ranging from .57 to .78 ( $p < .001$ ). The nine-item factor composing the CQS tapped the quality of communication during meetings or conversations between teachers and parents (see Table 4) on a 5-point Likert-type scale: 1 (*not at all*), 2 (*rarely*), 3 (*sometimes*), 4 (*often*), and 5 (*completely*). The alpha estimate for the CQS in the current study was .85 at T1 and .86 at T2.

### Analytic Approach

**Research Questions 1 and 2: Effect of CBC on classroom practices and collaborative process skills.** To test CBC's efficacy on teacher practices and process

Table 3. Teacher Competence in Problem-Solving Scale

Scale Item
1. I have identified a specific concern I have for my child.
2. I have gathered specific information (e.g., homework finished, number of tantrums) to help me understand how my child is doing.
3. I have set goals for my child.
4. I have identified specific things that can be changed to help my child's learning and behavior.
5. I have developed and used specific strategies to help my child with a problem.
6. I have gathered specific information to measure my child's progress.
7. I have figured out what helps my child and what does not.
8. I have determined how to continue helping my child make progress at home and school.

Note.—Items are rated on a Likert scale from 1 (*disagree very strongly*) to 6 (*agree very strongly*).

Table 4. Communication Quality Scale

Scale Item
1. Communicated agreement/disagreement in a calm manner.
2. Asked questions for clarification.
3. Communicated concerns with this student's parent in a clear and direct manner.
4. Used verbal or nonverbal indicators to convey understanding or facilitate the conversation (e.g., "um-hm," "gotcha," "OK").
5. Maintained involvement throughout the discussion without dominating the conversation.
6. Respected the opinions of this student's parent.
7. Acknowledged the concerns, perspectives, or ideas of this student's parent.
8. Expressed an understanding of the demands placed on this student's parent.
9. Responded to information shared by this student's parent.

Note.—Items are rated on a 5-point scale from 1 (*not at all*) to 5 (*completely*).

skills, we used an analysis of covariance, in which path analysis models were estimated separately for each outcome variable in Mplus 7.11 (Muthén & Muthén, 1998–2013). We used full information maximum likelihood robust to improve estimation under conditions of missing data (with the assumption that data were missing at random); this approach uses all available information without dropping cases and is compatible with the intent-to-treat analytic strategy that we employed (Enders, 2010). In the models, we included a dummy code (0 = *control*, 1 = *CBC*; experimental condition assignment) to represent the effect of CBC on outcomes at T2. We included the T1 measurement of outcomes as a covariate to equate the experimental groups at baseline and to partial out students' baseline levels from the effect of experimental condition on T2. We also included the sample cohort in which participants were recruited and randomized as a covariate across statistical models. Models were fully saturated; thus, model fit cannot be assessed. As measures of effect size, we present standardized coefficients that capture the magnitude of the relationship between predictors and outcomes (small = .14, medium = .36, large = .51; Cohen, 1992) and the  $R^2$  statistic that captures the amount of variance explained by the model, including all predictors and covariates (small = .02, medium = .13, large = .25; Cohen, 1992).

For the teachers' practices as observed directly in the classroom, the four baseline phase observations were aggregated as T1 and the six intervention phase observations were aggregated as T2. First, we calculated the proportion of times that each teacher behavior was recorded as present during a single observation period. Second, we averaged these proportion scores across the four baseline or six intervention phase observation periods (to produce T1 and T2, respectively). These outcomes were included in the models in the same fashion as self-reported outcomes. As a preliminary step to these models, we used empty multilevel models to examine whether the nesting due to children being nested within teachers (teachers received reported/received separate scores for each child) was sufficient to be included in the main effects models. The intraclass correlations produced from these models ranged from 0 to .88. Thus, cluster-robust standard errors were used to correct for the nonindependence of individuals from the same classroom for each of the outcomes (McNeish, Stapleton, & Silverman, 2016) investigated in the first two research questions.

**Research Question 3: Process skills as a mediator of CBC effects.** Multilevel structural equation modeling (Preacher, Zyphur, & Zhang, 2010) tested whether CBC's effect on teacher practices was indirect through teachers' process skills with parents (problem solving, communication quality). This model specification formally tests whether the postintervention process skills significantly (even if only partially) explain the effect of condition assignment on teacher practices. We conducted tests for the significance of indirect relations per the recommendation of MacKinnon (2008) using the product of the coefficients method. Per these recommendations, we included the direct effects between our predictor and mediator variables on our outcome variable in one model. In the multilevel structural equation modeling we used to test our hypotheses, two hierarchical levels were included, with the process skills (mediators) and teacher practices (outcome) at T2 modeled as Level 1 effects. Condition assignment (control, treatment) was modeled as a predictor at Level 2. We also allowed our two mediator variables to correlate. We included the T1 measurement of mediators and outcomes and cohort as covariates.

## Results

### Fidelity of CBC

The degree to which consultants adhered to the CBC objectives, and the quality of implementation, was assessed for 25% of CBC interviews. In all, high implementation fidelity was achieved. Averaging across all consultants and interviews, consultants adhered to 93%–96% of the CBC objectives. A 3-point scale was used to evaluate the quality with which each objective was met, from 0 (*not at all*) to 2 (*highly effective*). Average quality ratings were also quite high, with scores ranging from 1.64 to 1.81 (average = 1.75;  $SD = .15$ ) across CBC interviews (maximum possible score = 2.0).

### Preliminary Analyses

Descriptive statistics for T1 and T2 study variables are in Table 5. The CBC and control groups were statistically equal at baseline for all outcomes except for competence in problem solving; this inequality favors the control group. Baseline equivalence was established by including the baseline scores as covariates in all models. CBC fidelity matrices were developed to determine the degree of adherence to each objective across interviews and the quality with which consultants completed them. Thirty percent of these interviews were coded by two observers to determine interrater agreement. Consistent with the findings reported by Sheridan, Witte, Holmes, Coutts, et al. (2017), interrater agreement was high (range = 89.73%–94.20% across interviews).

### Research Question 1: Effect of CBC on Classroom Practices

Teachers' use of effective practices in the classroom was measured with both survey (self-report) and observational methods. The TSQ (Webster-Stratton, 2005) appropriate and inappropriate strategy use subscales were completed by teachers at

Table 5. Mean Scores (Standard Deviations) of the Study Outcome Variables

	Control		CBC	
	Time 1	Time 2	Time 1	Time 2
Self-report (survey) variables:				
<i>n</i>	92		134	
Appropriate strategy use <sup>a</sup>	3.00 (.53)	3.13 (.52)	2.97 (.50)	3.36 (.54)
Inappropriate strategy use <sup>a</sup>	1.92 (.43)	1.93 (.48)	1.97 (.48)	1.97 (.48)
Competence in problem solving <sup>b</sup>	4.41 <sup>c</sup> (.81)	4.81 (.64)	4.06 <sup>c</sup> (.84)	5.32 (.53)
Communication quality with parent <sup>d</sup>	4.30 (1.24)	4.47 (.45)	4.30 (.51)	4.57 (.47)
Observational variables: <sup>c</sup>				
<i>n</i>	104		145	
Effective command	1.34 (2.07)	1.08 (1.43)	1.34 (1.92)	1.30 (1.43)
Negative attention	2.24 (2.83)	2.06 (1.93)	2.28 (2.56)	2.00 (1.92)
Positive attention	2.39 (2.29)	1.99 (1.54)	2.62 (2.48)	3.48 (3.38)
Provide positive tangible consequences	.06 (.18)	.05 (.15)	.17 (.57)	.81 (1.31)
Use of reductive techniques	1.81 (6.60)	2.08 (10.46)	1.48 (6.63)	1.21 (4.75)

Note.—Teacher survey data are based on responses in relationship to the individual student participants in their classrooms. Teachers provided data for up to three student participants per classroom ( $M = 1.76, SD = .73$ ); hence, sample size is larger than the total number of teachers enrolled in the study. CBC = conjoint behavioral consultation.

<sup>a</sup> Based on the Teacher Strategies Questionnaire (Webster-Stratton, 2005). Possible frequency scores range from 1 (*low*) to 5 (*high*).

<sup>b</sup> Based on the Competence in Problem Solving Scale (Sheridan, 2004). Possible scores range from 1 (*low*) to 6 (*high*).

<sup>c</sup> Means marked with this note were not equivalent across experimental groups at baseline (Time 1; independent  $t$  test,  $p < .05$ ;  $t = 3.122, p = .002$ ).

<sup>d</sup> Based on the Communication Quality Scale (Sheridan, 2004). Possible scores range from 1 (*low*) to 5 (*high*).

<sup>e</sup> Data are based on teacher observations conducted in relationship to the individual student participants in their classrooms; hence, the sample size is larger than the total number of teachers enrolled in the study. Teachers were observed with up to three students per classroom ( $M = 1.76, SD = .73$ ). Scores are reported as percentage of time during 30-min observation that teachers were observed engaging in each behavior relative to target child.

T1 and T2; results of the main effect analyses are in Table 6. An effect for appropriate strategies favoring the CBC group indicated that, on average, improvement in self-reported use of appropriate strategies among teachers randomly assigned to receive CBC significantly outpaced that of teachers in the business-as-usual condition. In terms of the meaningfulness of these effects, a moderately large effect size ( $\beta = .47$ ) suggests that the average CBC participant achieved close to  $.5$ - $SD$  greater gains than the participant’s control group counterpart in his or her use of appropriate strategies from T1 to T2. Interpreting the effect size as a standardized metric under the normal curve, the average teacher in the CBC condition achieved greater pre-post gains than approximately 68% of control group participants. Similar significant effects were not observed for inappropriate strategies.

The effect of CBC on teachers’ practices was also assessed directly through classroom observations. As reported in Table 6, CBC had a significant impact on teachers’ use of positive attention and providing positive consequences. Both of these teacher practices increased among teachers who experienced CBC and at a significantly steeper rate than for teachers who did not receive CBC. In terms of the meaningfulness of these changes, moderate to large effect sizes ( $\beta = .50$  and  $\beta = .72$ , respectively) suggest that the average CBC participant achieved gains equaling  $.5$  to close to  $.75$   $SD$  greater than a control group teacher. Thus, a CBC participant demonstrated gains in positive attention that outpaced 69% of control group participants and gains in positive consequences that outpaced 77% of controls. Similar

Table 6. Results of Analysis of Covariance for the Effects of CBC on Teacher Classroom Practices and Collaborative Process Skills

Outcome	$[\alpha]/b$	SE	$p$	$[\alpha]/B$	$R^2$
Classroom practices:					
T2 appropriate strategies (SR):	[.86]			[1.59]	.59
T1 appropriate strategies (SR)	.75	.05	<.001	.71	
CBC	.25	.05	<.001	.47	
T2 inappropriate strategies (SR):	[.45]			[.92]	.48
T1 inappropriate strategies (SR)	.72	.07	<.001	.68	
CBC	.01	.05	.83	.02	
T2 effective praise (TO):	[.01]			[.48]	.50
T1 effective praise (TO)	.44	.06	<.001	.60	
CBC	.00	.00	.08	.16	
T2 negative attention (TO):	[.02]			[1.03]	.33
T1 negative attention (TO)	.31	.05	<.001	.43	
CBC	.00	.00	.94	-.01	
T2 positive attention (TO):	[.01]			[.45]	.38
T1 positive attention (TO)	.54	.09	<.001	.45	
CBC	.01	.00	<.001	.50	
T2 providing positive consequences (TO):	[.00]			[.22]	.16
T1 positive consequences (TO)	—	—	—	—	
CBC	.01	.00	<.001	.72	
T2 using reductive techniques (TO):	[.00]			[.10]	.05
T1 using reductive techniques (TO)	.20	.14	.16	.17	
CBC	-.01	.01	.50	-.10	
Collaborative process skills:					
T2 competence in problem solving (SR):	[3.60]			[5.73]	.31
T1 competence in problem solving (SR)	.28	.05	<.001	.38	
CBC	.60	.08	<.001	.95	
T2 communication quality (SR):	[3.66]			[7.85]	.17
T1 communication quality (SR)	.20	.09	.03	.38	
CBC	.11	.07	.14	.23	

Note.— $N = 148$ . Cohort was included as a covariate but is not reported here for simplification purposes. Standardized  $\beta$  coefficients (small = .14, medium = .36, large = .51; Cohen, 1992) and the  $R^2$  statistic (small = .02, medium = .13, large = .25; Cohen, 1992) are presented as measures of effect size. Significant ( $p < .05$ ) effects of CBC are in bold. CBC = conjoint behavioral consultation;  $[\alpha]$  = intercept; T2 = Time 2; SR = teacher self-report; T1 = Time 1; TO = teacher observations in relation to individual students in classrooms.

significant effects were not observed in other teachers' practices (effective commands, negative attention, and use of reductive techniques).

#### Research Question 2: Effect of CBC on Collaborative Process Skills

Teachers reported on their problem-solving competencies and communication quality with parents as a function of CBC. Results for the TCPS and CQS self-report measures are in Table 6. On average, self-reported problem-solving competence among teachers randomly assigned to receive CBC significantly outpaced that of teachers in the business-as-usual condition. The large effect size ( $\beta$ ) suggests that treatment group teachers' problem-solving skills improved by close to 1  $SD$  ( $\beta = .95$ ) more than control group participants from T1 to T2; CBC teachers outperformed 83% of control group teachers. Similar significant effects were not observed for teachers' communication quality.

Research Question 3: Mediation of Teacher Practices by Collaborative Process Skills

Figure 1 contains the standardized solution for the model testing for the indirect effect of CBC on teachers’ practices. The model had good fit and explained a large proportion of variance in changes in teachers’ practices. Teachers in the CBC condition had increased competent problem solving, which in turn related to increased positive teacher practices. Tests of the indirect effect revealed that the effect of CBC on teacher practices was significantly mediated by their use of competent problem solving. For teachers’ communication quality, teachers in the CBC condition had increased levels but only at the trend level. Teachers’ increased communication quality related to increased positive teacher practices. However, tests of the indirect effect were not significant.

Discussion

CBC is an intervention that directly aims to improve the skills of teachers and parents who are responsible for supporting students’ use of prosocial and adaptive behaviors in the classroom and home settings. To date, few studies have investigated the efficacy of consultation for promoting collaborative process skills (problem solving and communication quality). This study is the first to demonstrate how CBC promotes improvements in teachers’ practices. In particular, rural teachers who participated in CBC demonstrated improvements in certain classroom practices (self-reported appropriate strategy use, observed positive attention and posi-

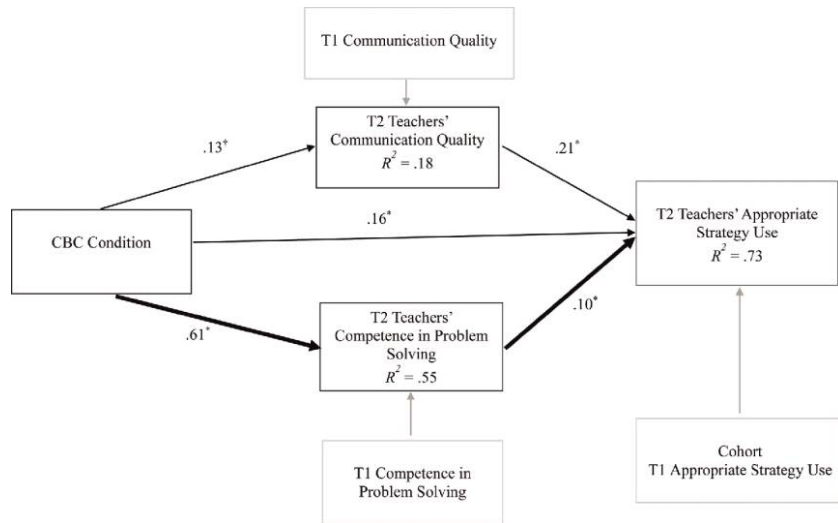


Figure 1. The standardized solution testing the effect of CBC on teacher’s classroom practices (use of effective strategies) as mediated by teachers’ process skills (communication quality, competence in problem solving;  $N = 148$  teachers).  $^*p = .075$ .  $^*p < .05$ . Model fit:  $\chi^2(35) = 66.11$ ,  $p = .001$ ; RMSEA = .06; comparative fit index = .92; standardized root mean square residual = .07. Indirect effects: communication quality,  $ab = .03$ ,  $p = .11$ ; competence in problem solving,  $ab = .06$ ,  $p = .02$ . T1 = Time 1; T2 = Time 2; CBC = conjoint behavioral consultation.



tive tangible consequences) and collaborative process skills (self-reported problem solving) relative to the control group. This study was the first to show that CBC increases teachers' use of positive teaching practices and strategies and improves problem solving and communication with parents. This finding is especially important for rural schools given that behavioral challenges among rural students are on the rise (Sheridan, Koziol, et al., 2014) and rural teachers have limited opportunities to develop positive behavior management and partnership skills (McClure & Reeves, 2004).

Teaching in rural settings presents a host of unique circumstances, including limited resources for supporting students with behavioral challenges that interfere with learning and the classroom environment. Opportunities for accessing support or professional development to address disruptive behaviors are limited in rural schools; thus, teachers are often left on their own to manage behavioral problems. CBC represents a unique intervention that capitalizes on the strength of relationships in rural communities and builds competencies in the caregivers across students' primary socializing systems (schools and homes). As such, it provides the opportunity for teachers to gain access to individualized support for students with the greatest challenges in their classrooms, enhances their capacity to use appropriate behavioral strategies in their classroom, and promotes the development of effective collaborative process skills for solving problems with parents.

### Teacher Practices

Behavioral consultation in schools is often touted as a desirable intervention given its (a) focus on improving teachers' skills for addressing challenging behaviors of individual students and (b) potential for generalizing to other students with similar concerns in current or future situations. This study found that a derivative of behavioral consultation, CBC, effectively supports teacher change in an area where few supports are available, such as rural classrooms. Specifically, self-report of appropriate behavioral strategy use, as well as positive behavioral management practices as noted by objective observers, increased in experimental but not control group participants. In fact, over time, teachers in the control group decreased their use of positive attention and delivery of positive tangible consequences and increased their use of negative reductive techniques. This is not surprising given that students in the study were selected because of negative, disruptive behaviors. Thus, without intervention, teachers' interactions with these students became less positive and more punitive. This study extends previous behavioral consultation research by documenting changes in teacher behaviors within the context of an intervention that also supports teacher-parent partnerships (Sheridan et al., 2012; Sheridan, Witte, Holmes, Coutts, et al., 2017; Sheridan, Witte, Holmes, Wu, et al., 2017).

Despite increases in teachers' positive and appropriate strategy use in relation to students' disruptive behaviors, no reductions in teachers' use of inappropriate and negative strategies (e.g., reductive techniques, negative attention) were noted. All intervention packages (a) emphasized positive reinforcement of students' desired behaviors and (b) included some form of positive reinforcement, and teachers reported that their use of positive classroom practices changed as a function of CBC.<sup>5</sup> It is possible that for students with significant behavioral problems, the CBC inter-

vention was useful for modifying their appropriate strategy use but insufficient to completely replace the use of negative attention, reductive techniques, and other inappropriate strategies. Future CBC implementation studies might include efforts to establish methods to reduce negative teaching strategies as they increase the use of positive strategies.

### Importance of Collaborative Problem Solving

In the present study, change in teachers' problem-solving skills served as the mechanism by which CBC improved teachers' classroom practices. It appears necessary for teachers to engage in methods to not only activate behavioral practices but also understand specific challenging behaviors and their function within particular contexts. It is possible that the collaborative nature of problem solving that characterizes CBC wherein teachers have significant input (e.g., describing their observations, exploring functions, selecting strategies, and developing tactics for use in their own classrooms) increases buy-in and thereby bolstered change in their own behaviors. Thus, a teacher's capacity to use newly learned practices is due in large part to an underlying understanding of methods to pinpoint, assess, and analyze behaviors; set behavioral goals; recognize behavioral function and related interventions; develop specific and relevant student plans; and evaluate a student's response and determine whether goals are being met. This finding documents empirically the mechanism by which consultation enables teachers to change their practices and contributes significantly to the extant literature that heretofore only speculated about the importance of the problem-solving process. Furthermore, these problem-solving skills are generalizable, and they allow teachers to utilize systematic, effective methods to explore, address, and evaluate problems in the future.

It is noteworthy that the problem-solving skills that teachers learned were acquired in the context of a collaborative, family-school partnership intervention. The context within which problem solving occurred was one in which the main systems within which children learn (family and school) cooperated and collaborated in proactive and intentional ways. It is unknown whether the problem-solving process skills found to mediate teachers' use of appropriate strategies were specific to the conjoint consultation process, or if similar effects would hold under conditions whereby teachers were working outside of the supportive collaborative context. This is an area ripe for future research.

### Limitations

Despite the positive outcomes and implications of the present study, certain limitations warrant consideration. First, the present study tracked teachers for the period in which they were involved in CBC. It is unknown whether the teachers continued to effectively partner with families and employ positive classroom management strategies long term. Future research could assess rural teacher practices following involvement in CBC to determine whether they continue to use the skills acquired from their participation in the intervention.

Second, this study took place in rural communities in the Midwest. It is the case that rural settings vary greatly within and across regions. Differences in a rural

community's economic base exist (e.g., whether dependent on agricultural, industrial, or commercial sectors for economic stability; Deavers, 1992). Sociocultural distinctions around which rural communities may be differentiated include the degree and quality of community relations, social ties, cultural practices, community values pertaining to the community, and civic engagement (Schafft, 2000). Finally, in terms of demographics, population density and size vary based on where the rural community is located relative to an urban center and the size of the community in terms of sheer numbers (Lobao & Hooks, 2007). These dimensions each present nuances that require consideration when drawing conclusions about the efficacy of interventions intended to support rural education and represent critical next steps in research.

Third, some measurement problems were apparent in this study. The internal consistency of the inappropriate strategy use subscale of the TSQ was lower than generally acceptable, which may have influenced the outcomes derived from that measure. Another measurement issue concerned the source of data related to teachers' competence in problem solving and communication quality. Specifically, both were assessed via self-report, with no observational data to corroborate teachers' statements. The research team developed the measures used for these purposes, and although the internal consistency estimates and factorial validity data are acceptable, limited psychometric information is available. Furthermore, although the correlation between the two measures is negligible, suggesting that they tap different constructs, more research is necessary to confirm that they are addressing their purported constructs.

Fourth, we have some information about teachers' exposure to training in behavioral management and family-school partnerships, but specific data on business as usual (supports for these teachers in their classrooms) are lacking. Future research needs to assess and understand characteristics, practices, and conditions within the counterfactual.

### Future Research Directions

Findings from this study provide initial support for CBC as an intervention that enhances teachers' practices and collaborative problem-solving skills. As the first study to explore these effects empirically, more research questions emerge. First, this study took place in rural communities in the Midwest. Differences in geographic dispersion, economic policy, and student and family demographics characterize some of many salient features on which rural communities vary. Future research is needed to consider variations within and across rural communities to uncover unique circumstances of rural organizations and setting and how they may interact with or impact CBC processes, uptake, and outcomes. Likewise, assessing whether variations in rural settings moderate the effects of CBC will greatly advance an empirical understanding of rural context and its effects on teacher practices.

A second area for future research concerns the need for empirically evaluating the long-term effects of CBC on rural teachers' effective classroom strategies. Consultation-based interventions assume that the behavioral strategies learned by consultees (in this case, teachers and parents) will generalize to other students and over time. Neither of these assumptions has been tested empirically in the con-

text of CBC, and within rural school environments. In this study, positive effects were found for both teachers' appropriate strategy use and collaborative problem solving with parents, and both are potentially important for rural schools where students' behavioral challenges are pronounced and services limited.

Third, although the importance of collaborative problem solving with parents mediated the influence of CBC on teachers' appropriate strategy use, it is not clear whether the same mechanism would be present in the absence of parents' engagement in the process. Additional research is needed to discern whether collaborative problem solving per se served as the mechanism for CBC's effects on teachers' appropriate strategy use or if the presence of parents in the collaborative context heightened the impact of problem solving and its influence on classroom practices.

## Notes

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1. Community locale is generally defined as urban, suburban, town, or rural. The National Center for Education Statistics (NCES) definition used in the present study distinguishes among these locales by size and proximity. The NCES rural locale provides fringe, distant, and remote subtypes that differentiate rural locations based on the distance and size of the nearest urban area. For a description and definitions of the NCES school locale codes, see <https://nces.ed.gov/surveys/ruraled/definitions.asp>.

2. National Center for Education Statistics locale classifications are based on Census-defined territories. Those used in this study were rural distant (territories that are more than 5 miles but less than or equal to 25 miles from an urbanized area, and territories that are more than 2.5 miles but less than or equal to 10 miles from an urban cluster; 20%), rural remote (more than 25 miles from an urbanized area and more than 10 miles from an urban cluster; 29%), rural fringe (territories that are less than or equal to 5 miles from an urbanized area, and territories that are less than or equal to 2.5 miles from an urban cluster; 4%), remote town (territory inside an urban cluster that is more than 35 miles from an urbanized area; 31%), distant town (inside an urban cluster and more than 10 miles and less than or equal to 35 miles from an urbanized area; 13%), and fringe town (inside an urban cluster and less than or equal to 10 miles from an urbanized area; 2%).

3. Details regarding students, target behaviors, and intervention procedures implemented to address behavioral concerns are reported in Sheridan, Witte, Holmes, Coutts, et al. (2017).

4. Home visits were also conducted by consultants. Details regarding support provided to parents are described in Sheridan, Witte, Holmes, Wu, et al. (2017).

5. Outcomes pertaining to students' behavior change are reported in Sheridan, Witte, Holmes, Coutts, et al. (2017).

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