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# An Exploratory Evaluation of Conjoint Behavioral Consultation to Promote Collaboration among Family, School, and Pediatric Systems: A Role for Pediatric School Psychologists

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**Abstract**

Pediatric school psychology is a relatively new subspecialty in the field; however, few specific, prescribed roles have been articulated, and fewer have yielded preliminary efficacy data. In this exploratory study, the acceptability and potential efficacy of conjoint behavioral consultation (CBC) as a model for linking families, schools, and pediatric settings to address concerns for children with medical issues were evaluated. Twenty-nine children, their parents, teachers, and consultants were involved in conjoint consultation, a model of cross-system collaboration to address shared concerns of

medically referred children. In this structured indirect service delivery model, parents, teachers, and school psychology pediatric consultants worked collaboratively in interdisciplinary problem solving and joint decision making with extensive input regarding medical issues from a developmental pediatrician. Outcome measures included parent and teacher observations of child functioning across home and school settings as a result of consultation-mediated interventions and social validity indices assessing acceptability and consumer satisfaction. Results suggested that CBC is a socially valid procedure for addressing concerns of medically referred children across home and school systems. Both parents and teachers reported the consultation process to be highly acceptable. Preliminary effect size analyses of child outcomes, derived from uncontrolled case study designs, suggest generally positive effects across home and school, although limitations with the methodology preclude conclusive statements. Research is needed to determine the contexts and conditions under which the model is more or less effective using rigorous controlled trials.

Over recent years the concept of pediatric care has expanded from a primarily medical definition to one that incorporates a comprehensive service delivery approach, including the disciplines of psychology and education (Perrin, 1999). Children who are treated by their primary health care providers for medical or health-related conditions often present with symptoms that affect their physical, academic, developmental, psychological, and social functioning. The effects of health problems have been associated with antisocial or criminal behavior, emotional disturbance, risk-taking behavior with negative repercussions, and unproductive academic and occupational performance later in life (Walker, Zeller, Close, Webber, & Gresham, 1999).

Medical, psychological, and educational needs of children with special health care needs often require the involvement of multiple professionals across many disciplines (Hoagwood, Kelleher, Feil, & Comer, 2000), including physicians, psychologists, and educators. Partnership across multiple systems supports "processes for monitoring and evaluating children's adjustment : : : [and] benefit[s] by combining perspectives from persons and information from school, family, and health care contexts" (Shapiro & Manz, 2003, p. 60). Through an interdisciplinary, collaborative approach, information can be shared and discussed in ways that may benefit individual providers.

The American Academy of Pediatrics (AAP, 2000; 2001) acknowledges the importance of collaborating with the major systems in children's lives. For medical and psychological disorders commonly experienced during childhood, the AAP recommends that physicians gather information from schools and parents regarding the core symptoms, duration of symptoms, and degree of functional impairment. Because a child's development is influenced by many interacting systems, collaboration among the major spheres of influence in a child's life (e.g., families, schools, health systems) can optimize outcomes, reduce health care costs, and lead to better detection, prevention, and management of child health conditions (AAP, 1993). This collaboration not only assists with treatment planning and service delivery but also allows key individuals in a child's life to feel empowered and responsible for improving their child's behavioral and medical outcomes (Williams, Klinepeter, Palmes, Pulley, & Meschan Foy, 2004).

School psychologists are in a unique position to collaborate with medical, educational, and family systems and provide comprehensive integrated services for children. Pediatric school psychology is a relatively new subspecialty that prepares school psychologists to

meet the complex needs of children with health-related disorders (Power, DuPaul, Shapiro, & Parrish, 1995). However, there is no unified conceptualization of prescribed roles or scope of practice for pediatric school psychologists, and few practice models have yielded preliminary effectiveness data. Pediatric consultation is one form of service highly relevant to school psychologists wherein a specialist (e.g., school psychologist)with training in specific content (e.g., pediatric issues, educational needs, behavioral interventions) and process (e.g., problem solving, relationship building) works with other individuals (e.g., teachers, parents) responsible for decision making pertaining to a child's medical needs. The emphasis on medical needs represents a difference from traditional roles and responsibilities of school psychologists that concern academic and behavioral problems experienced by children.

Conjoint behavioral consultation (CBC) is a model of service delivery that links parents, teachers, and other service providers, such as physicians, systematically and directly in the provision of services for children (Sheridan & Kratochwill, 1992; Sheridan, Kratochwill, & Bergan, 1996), with some empirical support (e.g., Sheridan, Eagle, Cowan, & Mickelson, 2001). Shapiro and Manz (2003) identified CBC as a model that can "effectively cross the barriers that commonly occur between medical and school professionals" (p. 61). CBC provides a structured and systematic process of addressing concerns for children across a variety of domains, including academic, social, emotional, and medical. Specifically, in CBC parents, teachers, and other specialists or treatment agents serve as partners in joint decision making to address the needs of children. Priorities are identified, defined, analyzed, and treated through mutual and collaborative interactions with the guidance and assistance of a school or child-oriented psychologist. As a partnership model, CBC allows for shared ownership in identifying effective programs for children and building on the strengths and competencies of each partner.

There are multiple goals of CBC within the context of pediatric school psychology. They include (a) developing an infrastructure for communication, information sharing, and decision making across educational, medical, psychological, and family systems; (b) addressing child needs as they occur within and across (rather than only within) systems; (c) facilitating effective interdisciplinary partnerships to benefit student learning and performance; (d) establishing joint responsibility for problem solving; (e) assessing problems comprehensively and conducting functional analyses of identified problems; (f) promoting consistency across settings and systems, thereby promoting maintenance and generalization of treatment effects; (g) empowering parents using a strengths-based orientation; and (h) developing knowledge, skills, and competencies to promote continued effective problem solving between family members, health care providers, and school personnel.

Sheridan et al. (2001) reported the outcomes of a 4-year study in which CBC was used to address a wide variety of academic, social, and behavioral concerns in students with disabilities or at risk for developing disabilities. The CBC cases involved consultation with 57 students, 53 parents, and 56 teachers. All of the cases included conjoint consultation among school psychologists, general or special education teachers, and family members. Results of the analyses found overall effect sizes (reported in standard deviation units, with .80 indicating a large effect) across cases to range from .83 to 1.36, suggesting strong effects of CBC. The procedures were rated very favorably by parents and teachers. Other

meta-analyses (Sheridan, Clarke, Knoche, & Edwards; 2006), small-*n* experimental studies (Colton & Sheridan, 1998; Sheridan, Kratochwill, & Elliott, 1990; Weiner, Sheridan, & Jenson, 1998), and controlled case studies (Galloway & Sheridan, 1994) have reported similar positive effects.

Although CBC conducted across home and school systems has been found to be highly effective, providers for children involved in multiple systems (including medical systems) have not been actively included in CBC research to date. The potential effectiveness of treatment programs for children may be maximized to the extent that key players (including parents and multiple service providers) work together to develop and support coordinated treatment plans. Power, DuPaul, Shapiro, and Kazak (2003) articulated clearly the role of CBC in medical-educational collaboration by indicating that "the CBC model provides a framework for (a) aligning the family, school, and health systems to facilitate the integration of children with health problems into school and (b) integrating systems of care into the problem solving process" (pp. 89–90). Its ability to build upon the strengths of the child and assets in the family, school, and health systems may be highly useful in designing strategies to prevent further risk and promoting resilience across the multiple contexts within which children function. To date, however, no research has been conducted that evaluates the potential usefulness of CBC in coordinated services for children across family, school, and medical systems.

The purpose of this exploratory study was to evaluate the acceptability and potential efficacy of CBC for children with medical concerns across home and school settings, with ongoing collaboration with a developmental pediatrician. The cases presented herein were conducted in naturalistic (versus controlled) conditions, with the intent of considering practical utility rather than scientific validity at this initial stage. Exploratory research questions were (a) How do parents and teachers rate the social validity of CBC in terms of acceptability of the model, satisfaction with the consultee, and perception of goal attainment? and (b) What are the parent- and teacher-reported effects of CBC in addressing identified concerns in a physician-referred sample?

## Methods

Data from this study were collected as part of a larger training grant awarded to Susan M. Sheridan and Cynthia Ellis by the U. S. Department of Education, Office of Special Education Programs. The program was a collaborative effort between a school psychology training program and a university medical center for the purpose of defining and developing the role of pediatric school psychologists within a medical setting. Doctoral students in school psychology were involved in a 1- to 3-year specialization training practicum that included didactic instruction related to pediatric disorders, interdisciplinary professional leadership, observations of medical pediatric practice, and supervised consultation casework.[1]

### *Participants*

Participants in this study were (a) 29 children in kindergarten through ninth grade who were receiving primary pediatric services through a major midwestern university medical

center, (b) 30 parents, (c) 39 schoolteachers, (d) 10 graduate student consultants, and (e) 2 developmental pediatricians. The 29 child participants were involved in a total of 36 consultation cases. Children were referred to CBC consultants by pediatricians due to the presence of behavioral or social-emotional difficulties that interfered with their functioning at home and/or school and learning in the classroom. Seven cases involved children and parents who participated in more than one consultation case (i.e., they were "repeat cases"). Five of these cases had two teachers serving as consultees. Demographic information for all participants was collected on self-report forms administered at the beginning of consultation. Parents reported demographic information for their children. Demographic information for all participants is presented in table 1.

**Table 1.** Demographic Characteristics of Participants

| Demographics | Consultant | Parent | Teacher | Child |
|---|---|---|---|---|
| Gender | | | | |
| Male | 10% | 20% | 3% | 66% |
| Female | 90% | 80% | 97% | 34% |
| Average age | 29.31 | 41.24 | 39.45 | 10.08 |
| *SD* | 4.90 | 6.23 | 12.78 | 3.05 |
| Ethnicity | | | | |
| White | 100% | 82% | 94% | 68% |
| Other | | 18% | 6% | 32% |
| Average grade | | | | 4.36 |
| Medical diagnosis | | | | |
| ADHD | | | | 81% |
| Other | | | | 19% |
| Medications | | | | |
| Stimulants | | | | 77% |
| Degrees held | | | | |
| High school diploma | | 30% | | |
| Some college | | 19% | | |
| Bachelor's degree | 10% | 30% | 61% | |
| Master's degree | 90% | 19% | 39% | |

Consultants in this study were 10 graduate students in school psychology who were trained to mastery in the procedural implementation of CBC. Specifically, they completed a year-long combined didactic course and practicum in CBC. Five of the 10 consultants supervised other graduate-level consultants in their CBC casework; all consultants completed additional years of CBC casework. Additionally, through involvement in a specialized training practicum in pediatric psychology, all consultants had training in issues pertaining to medical pediatrics and interdisciplinary leadership, including weekly didactic instruction pertaining to pediatric disorders and professional leadership, observations of pediatricians in clinical practice, and individual casework for medically referred children. In this study, consultants worked with developmental pediatricians and were

involved in consultation with parents and teachers as part of the overall services offered through the pediatric clinics. Consultants' ages ranged from 23 to 38 years. Nine of the 10 consultants were female and all were White.

Two developmental pediatricians, 1 female and 1 male, were involved in this project. Both were board certified in Developmental/Behavioral Pediatrics and were professionally established, practicing medicine for 18 and 27 years, respectively.

***Setting***

Consultation cases were conducted in 19 elementary, 13 middle, and 3 high schools in a large midwestern city. The majority of consultation interviews were held in teachers' classrooms. Interventions were implemented in the schools and homes of child participants.

***Outcome Measures***

Outcomes were measured on a number of dimensions. Social validity data (i.e., perceptions of goal attainment, ratings of acceptability and satisfaction) were collected for each case. Parent and teacher reports of target behaviors in naturalistic settings (i.e., at school or home) and/or permanent products (e.g., completed assignments) were also collected for each case. At school, data for 30 cases (88%) were collected using teacher observations, and permanent products were collected for 4 cases (12%). The method of data collection at school was missing for 2 cases. At home, data for 25 cases (83%) were collected using parent observations; 5 cases (17%) collected permanent products. Information describing the method of data collection at school was missing for 6 cases.

*Perception of goal attainment*

Parents and teachers completed a *Goal Attainment Scaling* (*GAS*; Kiresuk, Smith, & Cardillo, 1994) rating following termination of consultation services to assess their perceptions of child participants' behavioral goal attainment. This measure requires that parents and teachers rate the degree to which they agree that the child behavioral goal (developed during the Conjoint Problem Analysis Interviews [CPAI] phase of consultation) was attained using a scale of –2 (situation got significantly worse) to +2 (goal completely met). For purposes of analysis, ratings on the *GAS* were adjusted to a 5-point scale (1–5), with 5 corresponding to *goal completely met*.

The *GAS* has been used in applied research to assess consumer perceptions of child participants' behavior change goals (Sheridan et al., 2001; Sladeczek, Elliott, Kratochwill, Robertson-Mjaanes, & Stoiber, 2001). Excellent reviews of the reliability and validity of the *GAS* have been documented (Cardillo & Smith, 1994; Smith & Cardillo, 1994). Specifically, interrater reliability indices between $r = .87$ (Kaplan & Smith, 1977) and $r = .93$ (Schippits & Baxter, 1978, as cited in Cardillo & Smith, 1994) have been reported, and test-retest reliability analyses have yielded product moment correlations of $r = .84$. Evidence has also been found for criterion-related (Jacobs & Cytrynbaum, 1977) and construct validity (e.g., Johnson & Greenberg, 1985) of the *GAS*. The *GAS* has been used extensively in this manner in consultation (Roach & Elliott, 2005) and CBC research (cf. Illsley & Sladeczek, 2001; Sheridan et al., 2001; Sladeczek et al., 2001).

*Subjective evaluation of acceptability*

Parents' and teachers' subjective perceptions of CBC acceptability were assessed on a revised version of the *Behavior Intervention Rating Scale-Revised* (*BIRS-R*; Von Brock & Elliott, 1987). The original *BIRS* consists of 24 items rated on a 6-point Likert scale (1 = *not at all acceptable*; 6 = *highly acceptable*). Factor analysis of the original *BIRS* has yielded three factors: Acceptability, Effectiveness, and Time to Effect (Elliott & Von Brock Treuting, 1991). For purposes of this study, only the Acceptability factor was used. This factor comprises 15 items and yields information regarding the acceptability of intervention procedures. Von Brock and Elliott reported an alpha coefficient of .97 for the Acceptability factor. Minor revisions of the *BIRS*'s original wording made the instrument applicable to consultation procedures while maintaining psychometric soundness (Freer & Watson, 1999; Sheridan & Steck, 1995). Teachers and parents completed the *BIRS-R* upon completion of CBC.

*Satisfaction with consultation services*

The *Consultant Evaluation Form* (*CEF*; Erchul, 1987), a 12-item, 7-point Likert-type scale, was completed by all parents and teachers upon completion of their cases. Items on this scale request information on consultee perceptions regarding the helpfulness of the consultant, the benefits of consultation, and overall satisfaction with the consultation experience. Possible responses range from 1 (*not at all satisfied*) to 7 (*highly satisfied*). Research with the *CEF* has yielded adequate internal consistency estimates (alpha = .95; Erchul, 1987). For CBC, alpha coefficients of $r$ = .83 and $r$ = .89 were found for teacher and parent scales, respectively (Sheridan et al., 2001).

*Parent and teacher reports of target behaviors*

Specific target behaviors were identified for each child participant. Parent and teacher observations and reports of these behaviors served as the primary measures of target behaviors. Measures of target behaviors were collected continuously by parents and teachers throughout all experimental phases (i.e., baseline, treatment, and follow-up). Data collection forms (i.e., "Behavioral Records") were completed by parent and teacher consultees to (a) standardize the observational procedures, (b) provide an opportunity to train consultees in data collection procedures, and (c) provide a permanent record of behavioral data (Noell, 2008). In some situations, the target behavior was defined in terms that generated a permanent product (e.g., homework completion). No reliability data are available for these measures.

***Procedures***

*Conjoint behavioral consultation*

Conjoint behavioral consultation (CBC; Sheridan & Kratochwill, 1992, 2008) procedures, extended to incorporate a pediatric emphasis for medically referred children, were used in this study. This application of CBC involved close collaboration between school psychology consultants and developmental pediatricians and among consultants, parents, and

teachers. This maximized the unique perspectives and expertise of each party in the consultation process, with the school psychologist consultant serving as a liaison linking the physician, parents, and teachers.

Pediatricians and school psychology consultants worked jointly in the medical clinic collecting information from families and determining the appropriateness of CBC. The physicians were familiar with the CBC process and referred patients they believed would benefit from home-school consultation services (e.g., situations where parent reported problem behaviors that interfered with school and/or home functioning). Even though the physicians were not involved in CBC meetings by design, they were linked in an ongoing way with families and schools. Developmental pediatricians provided relevant medical information to the school psychology consultants, and consultants shared information concerning school or learning issues with pediatricians. Although the pediatricians were not present at formal, school-based consultation meetings, they were included in the collaborative process via regular, ongoing communication with the consultant and parents of referred children. For example, upon initiation of CBC casework, pediatricians and consultants maintained close contact with each other through weekly meetings to share relevant information (e.g., impressions of school-related behaviors and issues), review case progress, and collaborate regarding medication adjustments as part of the intervention package developed through the consultation process. Consultants served in a role of liaison between all systems (medical, family, school).

Formal CBC casework conducted in the schools of referred children followed a four-stage problem-solving model: (a) needs (problem) identification, (b) needs (problem) analysis, (c) plan implementation, and (d) plan evaluation (Kratochwill & Bergan, 1990; Sheridan & Kratochwill, 2008; Sheridan et al., 1996). Consistent with the desire to conduct preliminary and descriptive analyses of outcomes in naturalistic settings versus highly controlled conditions, cases were highly individualized and variable in their identified target behaviors and interventions. No attempt was made to control target concerns or standardize behavioral interventions. Both parents and teachers attended all consultation meetings with the consultant and were involved conjointly in all aspects of the process. The problem-solving stages were initiated via structured interview procedures (Sheridan et al., 1996). Consultation meetings generally occurred on a weekly to biweekly basis over the course of 8 to 10 weeks, and each consultation meeting was approximately 1 hr in length. Review of the interview formats is beyond the scope of this article. Interested readers are referred to Sheridan and Kratochwill (2008).

Upon referral for CBC, parents provided consent consistent with institutional research guidelines. Releases to exchange information between the clinic, school, and family also were obtained. Consultants scheduled a preconsultation meeting with parents and teachers during which the CBC process was described, roles and responsibilities were discussed, and consent was obtained. Additional purposes of the preconsultation meeting were to initiate a working relationship between parents, teachers, and the consultant and establish a feeling of shared ownership and home-school partnership. General information regarding consultees' concerns for the child participant was discussed as well as information about the child's strengths.

Approximately 1 week following the preconsultation meeting, the first formal stage of consultation (problem/needs identification) was initiated via the Conjoint Problem Identification Interview (CPII). Parents, teachers, and the consultant collaboratively identified and objectively defined target behaviors for the child participant. In most cases, target behaviors were identified for both home and school settings. Target behaviors were defined as behaviors the child needed to either increase or decrease in his/her behavioral repertoire. Across cases, 31% of target behaviors at school were behavioral in nature (e.g., out of seat, compliance, on-task, personal hygiene), 46% were academic (e.g., schoolwork initiation and completion, language skills), and 23% were social-emotional (e.g., play behaviors, social interactions). For home settings, 37% of target behaviors were behavioral, 43% academic, and 20% social-emotional. Baseline data collection procedures were also discussed during the consultation interview, including information regarding procedures for conducting direct observations (i.e., recording techniques). Consultants remained in contact with consultees throughout the consultation process to answer any questions and monitor consultees' observational procedures. They also provided information to pediatricians regarding the expressed concerns of parents and teachers and identified target behaviors for home and school.

In the Conjoint Problem Analysis Interviews (CPAI), which occurred approximately 1 to 2 weeks following the CPIIs, consultants, parents, and teachers analyzed the baseline data, determined behavioral goals, assessed conditions surrounding the behaviors' occurrences, and developed behavioral interventions. Table 2 identifies the intervention components used across cases. All interventions chosen for the target behaviors of concern were behavioral interventions supported by empirical research literature and were linked to the function of presenting behaviors. The consultant and parent collaborated with the developmental pediatrician to identify options for alterations of medication (e.g., adjusting dosage, schedule, or type of medication). Consultants served as liaisons in these cases, speaking with pediatricians about medication issues and communicating this information to school personnel and families.

**Table 2.** Target Behavior, Intervention, and Effect Size for Home and School

| Case | Target behavior | Intervention | Number of sessions | Effect size[a] |
|---|---|---|---|---|
| 36 | Task completion | Graphic organizer<br>Reinforcement<br>Prompts | 4 | 6.76 |
| 14 | Language skills | Prompts<br>Token system<br>Instruction | 5 | 2.38 |
| 4 | Social interactions | Prompts<br>Reinforcement<br>Self-monitoring | 3 | 2.19 |
| 18 | Compliance/<br>Social interactions[b] | Prompts<br>Structured environment<br>Instruction | 3 | 2.11/1.11[b] |

| | | | | |
|---|---|---|---|---|
| 2 | Social interactions | Instruction<br>Praise | 3 | 1.99 |
| 25 | Organizational skills | Graphic organizer<br>Prompts<br>Reinforcement<br>Homework organization | 5 | 1.70 |
| 15 | Language skills | Reinforcement<br>Differential attention | 5 | 1.41 |
| 34 | Social interactions | Prompts<br>Reinforcement | 7 | 1.31 |
| 12 | Work completion | Goal setting<br>Self-monitoring<br>Homework organization | 3 | 1.29 |
| 32 | Compliance | Differential attention<br>Reinforcement<br>Home-school note<br>Structured consequences<br>Self-monitoring | 3 | 1.18 |
| 24 | Social interactions | Reinforcement<br>Instruction<br>Home-school note<br>Structured environment | 3 | 0.85 |
| 28 | Independence/<br>On-task behavior[b] | Graphic organizer<br>Reinforcement<br>Self-monitoring<br>Goal-setting | 7 | 0.84/0.84[b] |
| 28 | Independence/<br>On-task behavior[b] | Graphic organizer<br>Reinforcement<br>Self-monitoring<br>Goal-setting | 7 | 0.84/0.84[b] |
| 5 | Work completion | Self-monitoring | 3 | 0.77 |
| 33 | Reading fluency | Reading intervention<br>Reinforcement | 5 | 0.68 |
| 35 | Anxiety | Instruction | 4 | 0.42 |
| 7 | Language skills/Compliance[b] | Prompts | 3 | 0.39/0.00[b] |
| 8 | Work initiation | Self-monitoring<br>Reinforcement | 2 | 0.35 |
| 20 | Work completion | Homework organization<br>Monitoring and feedback<br>Reinforcement<br>Home-school note | 3 | 0.33 |
| 26 | Compliance | Token system<br>Structured environment<br>Reinforcement | 4 | 0.22 |
| 31 | Compliance/<br>Anger management[b] | Instruction<br>Reinforcement<br>Home-school note | 4 | NA/0.22[b] |
| 13 | Work completion | Goal setting<br>Self-monitoring<br>Homework organization | 3 | 0.09 |

| | | | | |
|---|---|---|---|---|
| 11 | Work completion | Goal setting<br>Self-monitoring<br>Homework organization | 3 | –0.19 |
| 27 | Anger management | Instruction with prompts<br>Goal setting<br>Structured consequences<br>Reinforcement<br>Prompts | 4 | –0.88 |
| 22 | Inattention/<br>On-task behavior[b] | Structured environment<br>Graphic organizer<br>Reinforcement<br>Differential attention | 3 | NA/–2.21[b] |
| 1 | Personal hygiene | Prompts<br>Self-monitoring<br>Reinforcement | 3<br>— | NA |
| 6 | Impulsivity | Prompts | 4 | NA |
| 9 | Talking out | Structured consequences<br>Self-monitoring | 4 | NA |
| 10 | Social interactions | Instruction<br>Reinforcement<br>Error correction | 5 | NA |
| 16 | On-task behavior | Reinforcement<br>Home-school note | 5 | NA |
| 17 | Work completion | Home-school note<br>Structured environment<br>Reinforcement | 4 | NA |
| 19 | Work completion | Homework organization<br>Reinforcement<br>Prompts | 3 | NA |
| 3 | Work completion | Prompts<br>Reinforcement<br>Structured consequences | 3 | NA |
| 21 | Work completion | Homework organization<br>Structured environment<br>Reinforcement<br>Monitoring and feedback | 3 | NA |
| 23 | Work completion | Home-school note<br>Reinforcement<br>Structured environment | 3 | NA |
| 29 | Social interactions | Reinforcement<br>Differential attention<br>Structured environment<br>Social stories<br>Structured consequences | 3 | NA |
| 30 | Compliance/<br>On-task behavior[b] | Differential attention<br>Prompts<br>Home-school note<br>Reinforcement | 3 | NA |

a. Effect sizes represent average effects across home and school outcomes. Effect size is calculated using a "no assumptions approach" (Busk & Serlin, 1992).
b. Behaviors listed represent those targeted at home and school, respectively. Effect sizes are those obtained at home and school, respectively.

Interventions were implemented by parents and teachers in home and school settings during the treatment implementation stage of consultation. Although no formal interview was conducted during this stage, consultants maintained close contact with parents, teachers, and pediatricians via classroom visits, telephone calls, and email. The purposes of these contacts were to monitor the intervention, provide feedback regarding intervention implementation, offer support or training, and identify the need for adjustment to the plans.

The last stage of the consultation process was plan evaluation, which involved Conjoint Plan Evaluation Interviews (CPEI). These occurred approximately 1 to 3 weeks following treatment implementation, depending on consultee availability for meetings and the nature of the target behavior (e.g., low vs. high rates of behavior, warranting different lengths of intervention before evaluation). The purpose of the CPEI was to evaluate the behavioral data, discuss progress toward consultation goals, make any necessary modifications to treatment plans, and plan for either future follow-up meetings or termination of consultation services. In most cases, at least two CPEIs were conducted to allow for plan revision and reevaluation. At the end of the final CPEI meeting, consultants provided parents and teachers with a packet of forms containing the *GAS*, *BIRS-R*, and *CEF* rating scales. Consultees were asked to complete the packet and return it to the consultant in a self-addressed stamped envelope provided to them.

*Integrity of the CBC process*

CBC Objectives Checklists (Sheridan et al., 2001) were used to verify that the consultation interviews conducted in this study were consistent with the CBC model. All CBC interviews were audiotaped, and a trained observer coded 17% of the interviews to determine their adherence to each of the interview objectives. Across all coded interviews, 80% of CBC objectives were attained by consultants.

### *Data Analysis*

Subjective evaluations and social validity indices were assessed. These data are reported descriptively. Effect sizes for individual (single subject) cases were computed to quantify the behavioral change evidenced at home and school, based on behavioral data collected by teachers and parents (Busse, Kratochwill, & Elliott, 1995; Kratochwill, Elliott, & Busse, 1995). The most appropriate way to compute effect sizes for small-*n* and single case designs is a topic of considerable discussion. Currently there is no consensus on the most defensible approach, and the problem for applied researchers is complicated by the need for extensive numbers of data points within phases, which is typically difficult to achieve in case studies. Other methods require the attainment of certain assumptions such as equality of variance. Because assumptions common to group designs could not be assured, a decision was made

to use the "no assumptions" approach (Busk & Serlin, 1992), computing effect sizes without assumptions regarding population distributions or homogeneity of variance. With this approach, the difference in phase means within a given case is divided by the standard deviation of the baseline, which produces a quantitative index of treatment effects. Effect sizes of +1 or more indicate that the effect size is similar to one or more standard deviation units above the expected baseline mean. Effect sizes are calculated based on the standard deviation of the baseline phase; thus, behaviors that display a great degree of baseline variability result in lowered effect sizes.

## Results

Results of the CBC-based interventions in relation to the two exploratory research questions are presented in table 3. Specifically, subjective evaluations of social validity data (i.e., perceptions of goal attainment, acceptability, and satisfaction) are presented, as are behavioral outcomes across home and school settings as reported by parents and teachers.

**Table 3.** Objective and Subjective Outcomes of Medically Referred CBC Cases

| | Home | | School | |
|---|---|---|---|---|
| Outcome measure | *M* | *SD* | *M* | *SD* |
| Effect size | 2.25 | 2.43 | .57 | .96 |
| | (*Mdn*[a] = 1.6) | | (*Mdn*[a] = .55) | |
| *BIRS-R*[b] (Acceptability factor) | 5.26 | .61 | 4.92 | .85 |
| *GAS*[c] | 4.04 | .66 | 4.00 | .85 |
| *CEF*[d] | 6.38 | .56 | 5.80 | .97 |

a. *Mdn* = Median
b. *BIRS-R* = *Behavior Intervention Rating Scale–Revised* (Acceptability factor), measuring acceptability of CBC, with possible mean item scores ranging from 1 (*not at all acceptable*) to 6 (*highly acceptable*)
c. *GAS* = *Goal Attainment Scaling*, measuring attainment of consultation goals, with scores ranging from 1 (*goal not met; situation got significantly worse*) to 5 (*goal completely met*)
d. *CEF* = *Consultant Evaluation Form*, measuring satisfaction with consultation services, with possible mean item scores ranging from 1 (*not at all satisfied*) to 7 (*highly satisfied*)

### *Parent and Teacher Perceptions of Goal Attainment*

Goal attainment scaling procedures were used as a second measure of perceptions of outcomes. On a scale of 1–5 (with 5 representing the belief that the consultation goal was completely met), parents' ratings reflected positive outcomes ($M$ = 4.0, $SD$ = .7). Teachers' goal attainment ratings were also positive, averaging 4.0 ($SD$ = .9).

### *Parent and Teacher Ratings of CBC Acceptability*

Ratings of parents' and teachers' acceptability of CBC were collected on the Acceptability factor of the *Behavioral Intervention Rating Scale–Revised* (Elliott & Von Brock Treuting, 1991). On a scale of 1–6 (with 6 being highly acceptable), parents and teachers uniformly

rated the CBC procedures very to highly acceptable. Mean item parent acceptability ratings on the *BIRS-R* Acceptability factor averaged 5.3 (*SD* = .61); mean item teacher acceptability ratings averaged 4.9 (*SD* = .85).

***Parent and Teacher Satisfaction with CBC Services***

As indicated in table 3, parents and teachers reported high levels of satisfaction with CBC and the consultant. Mean item satisfaction ratings on the *Consultant Evaluation Form* (possible range 1–7 with high scores reflecting greater satisfaction) were 6.38 (*SD* = .56) for parents and 5.8 for teachers (*SD* = .97).

***Behavioral Outcomes***

Effect sizes were computed based on behavioral data collected by parents and teachers in home and school settings. Parent and/or teacher data, and thus effect sizes, were available for 27 cases. Across all settings and cases, effect sizes averaged 1.42 (*SD* = 2.0). Average school effect sizes were .57 (*SD* = .96), and the mean home effect size was 2.25 (*SD* = 2.4). Across settings and individual cases, effect sizes ranged from .05 (small) to 6.76 (large). As shown by the large standard deviations, there was a substantial amount of variability in the outcomes. Therefore, median effect sizes may be better indicators of outcomes; across school and home settings, median effect sizes were .55 and 1.61, respectively (total median effect size = 1.1).

## Discussion

This study provides an illustration of the utility and social validity of CBC with a physician-referred sample of children with medical concerns. Conjoint behavioral consultation provided both a mechanism and a structure by which referral issues were defined, case issues explored, intervention plans developed, treatments implemented, and outcomes evaluated across the major systems in a child's life. It is important to note that as a model of service delivery that actively involves multiple caregivers and supports, CBC promoted meaningful participation of parents, teachers, and developmental pediatricians in planning and problem solving for children.

CBC has been suggested as a potentially useful model for addressing the cross-setting concerns facing pediatric clients (Power et al., 2003). Although many studies have documented the efficacy of CBC in addressing referral concerns across home and school settings (e.g., Colton & Sheridan, 1998; Galloway & Sheridan, 1994; Sheridan et al., 2001; Sheridan et al., 1990; Weiner et al., 1998; Wilkinson, 2005a, 2005b), this preliminary study was the first to date to demonstrate the effectiveness of CBC services with a physician-referred sample and include medical providers in ongoing collaboration and coordination of treatments. In this exploratory study, developmental pediatricians were actively involved in referring children for CBC services and collaborating with families and school professionals in the delivery of medical interventions (i.e., timing, dosage, and type of medication adjustments). CBC consultants (i.e., school psychology graduate students) worked closely with pediatricians and provided a direct link between medical professionals and the home and school systems, thus facilitating coordinated and comprehensive services for children.

The generally encouraging effect sizes and goal attainment scores found across home and school environments suggest that the interventions developed in CBC hold promise for addressing the presenting behavioral concerns for medically referred children. Effects appeared greatest at home compared with school; however, lack of standardization in data collection procedures suggests the outcome should be viewed with caution.

It is important to note that outcomes of CBC-mediated interventions yielded higher effect sizes in home environments compared with schools. Variability in outcomes also was apparent as noted in the rather sizable standard deviations and range of outcomes. It is important that future research investigate more carefully the contexts and conditions under which CBC is effective and those under which alternative (e.g., direct) services are potentially more efficacious, with the intent of further refining practice.

Perhaps related to the fact that home-based effect sizes outweighed those at school, parents routinely provided higher social validity ratings (i.e., perceptions of acceptability, satisfaction) than teachers. It is possible that CBC consultants were successful in promoting and delivering services in a manner consistent with principles of family-centered services, and these were recognized by parents as meaningful. However, specific perceptions of family members' experiences were not assessed, and it is not possible to ascertain what contributed to parents' high ratings of acceptability and satisfaction. For example, it is possible that their involvement led to feelings of being valued and validated, positive experiences related to communication and partnering, or enhanced notions regarding their role in their child's medical care and educational planning. Focus groups or follow-up interviews may be useful to learn more about these important process variables and whether they were operative in parents' reports of CBC acceptability.

The mechanisms by which CBC results in favorable outcomes is yet to be determined. It is likely that the collaborative process of intervention development, implementation, and evaluation was beneficial. Although the verbal contributions of each member were not evaluated, including the specific contributions of the developmental pediatricians, it is common in CBC for individual members to share knowledge and expertise throughout the treatment process to aid in decision making (see Erchul et al., 1999). It is also possible that the consistency with which the interventions were delivered (i.e., simultaneous implementation across both home and school environments, coordinated with medical interventions) favorably impacted the results. Despite the fact that objective treatment integrity data were not collected, self-report information and permanent products (e.g., completed home-school notes and reinforcement charts) indicated that children were provided consistent support across home and school environments by parents and teachers, in turn promoting success in their primary naturalistic environments.

Both parents and teachers reported high acceptability and satisfaction with CBC when delivered by a pediatric school psychology consultant, indicating they found the consultation process to be a meaningful strategy for addressing their child's needs. Parents tended to report more favorable perceptions of the model than teachers, suggesting that they considered some elements of the experience more useful and satisfying. Although not formally assessed, physicians' perceptions of the CBC process were verbally communicated to consultants, and they were highly favorable. Physicians reported that they appreciated

the opportunity to offer their patients needed support in the home and school environments. Further, they recognized the importance of behavioral information gathered from parents and teachers that aided in their decision making regarding medication adjustments. Specific impressions of parents, teachers, and physicians could be evaluated to determine those components that are more or less important and helpful to individuals, representing different perspectives in a child's life.

***Limitations and Research Needs***

Despite the encouraging findings of the present exploratory study, several limitations in the research are noted that warrant caution in interpreting the results. First, the data reflecting the intervention outcomes on child behaviors were collected by parents and teachers who were arguably biased by their involvement in the CBC procedures. Furthermore, independent observations of child behaviors and parent and teacher intervention practices were not conducted. There are a number of limitations associated with this type of assessment, including various types of error variance (i.e., source, setting, and instrument variance) and response bias from raters (i.e., halo effects, leniency effects, central tendency effects). Although these are considered research limitations, the strategies discussed herein represent naturalistic problem-solving consultation cases and followed a "best practices" approach to data-based decision making. Multisource, multimethod, multisetting assessment strategies were used to evaluate case outcomes, and in most situations, additional outcome measures corroborated behavioral data collected by parents and teachers. Although rigorous research designs with highly prescriptive measurement and analysis techniques were not employed, this approach to field research included multiple elements that allowed meaningful inferences to be drawn from the case data (Galloway & Sheridan, 1994; Kratochwill, 1985). The applied nature of this work is relevant for establishing potential benefits and informing future research efforts. Furthermore, naturalistic research such as reported here is essential to uncover unique nuance regarding application, implementation, and individual response to intervention. In addition to naturalistic research, however, research utilizing more highly controlled procedures and independent observers in data collection is necessary to determine the efficacy of pediatric CBC with greater certainty.

Another limitation of this study includes the lack of diagnostic diversity within the sample population. A majority of the child participants in this study were diagnosed with attention deficit/hyperactivity disorder (ADHD), with 77% of the children receiving medication as part of their treatment (see table 1). It is possible that the nature or severity of the behaviors exhibited by the child participants impacted parents' and teachers' ratings. Parents and teachers of children with less disruptive behaviors may place different, more stringent standards on their ratings of the consultation process. Furthermore, the unique effects of CBC-mediated interventions distinct from medical or other treatments are unknown. Future research could examine this issue.

Systematic objective data were not collected on the integrity with which parents and teachers implemented the interventions with children. Researchers have suggested that generalization of consultation recommendations to consultees' actions be assessed in applied studies (Noell, Gresham, & Gansle, 2002). Research is needed to assess consultees'

skills at implementing interventions within consultation programs, the relationship between these consultee skills and consultation outcomes, and associations between degree of implementation integrity and behavioral change.

The pediatricians who participated in this study were developmental pediatricians and not physicians practicing in primary care pediatric offices. The nature of developmental pediatric practice is such that these specialized pediatricians tend to see more complex cases and generally spend more time and resources on each patient than pediatricians practicing in a standard primary care pediatric practice. It is possible that general pediatricians may not have the ability in time or resources to collaborate with psychological consultants, families, and schools in the same way that the pediatricians involved in this study did, thus potentially limiting the generalizability of this model and these results. Furthermore, pediatricians' perceptions of their involvement in CBC were not formally assessed. Although pediatricians were not directly involved in the formal CBC meetings with parents and teachers, they were integrally involved by (a) helping families identify problem areas and making the referral to the school psychology consultant, (b) working with the consultation team to provide medication adjustments that meaningfully complemented the onset of behavioral interventions when necessary, and (c) gathering information from the consultation team on children's progress at home and school. Future research could assess various methods for involving pediatricians in CBC casework. Specifically, it is necessary to identify the aspects of the consultation process most appropriate and meaningful for pediatrician involvement and the degree to which they can be involved given limitations on their time and availability.

The specific medications and medication changes for children in this study were not routinely recorded and reported. It should be noted that changes in medications likely had an impact on the behavioral outcomes for children involved in this study. Thus, it is probable that the behavioral interventions implemented in the context of CBC worked in concert with medication to promote the outcomes represented in this study. Presently, it is not possible to disentangle the effects of the CBC-based behavioral intervention from the psychopharmacological intervention. Future research could examine more closely the relationship of these variables independent of one another.

Finally, although effect sizes proved to be modest to high for all participants, there are limitations associated with the effect size statistic that was used in this exploratory study. Computation of effect sizes with single subject data is influenced by variability and/or basal and ceiling effects within phases (i.e., baseline, treatment), which was not ruled out in these analyses. It is possible that the effect sizes found in this study may be inflated due to autocorrelation, and the benchmarks for interpreting treatment effectiveness may be distorted because of the single subject nature of this research (Parker et al., 2005). Specifically, although frequently used to assess treatment effects with single subject research, the no assumptions approach used to compute effect sizes does not control for autocorrelation and can provide an inflated representation of treatment effects (Parker et al., 2005). Furthermore, the standard benchmarks that Cohen (1992) has defined for small, medium, and large effect sizes were designed from large sample research with sufficient variability. These benchmarks may not generalize to small sample (i.e., single subject) research (Parker et al., 2005). Finally, the standard deviation for effect sizes is large, suggesting a great deal

of variability in outcomes. Given these limitations, readers are cautioned not to over interpret the generally high effect sizes found in this study as a sole indicator of treatment effectiveness.

### Implications for Practice

The CBC process was shown to be an effective and acceptable means of addressing concerns across home and school settings for medically referred children. Multisystemic collaboration among the important adults in children's lives (i.e., parents, teachers, and physicians) allowed for the contribution of unique information across environments in treatment planning, implementation, and evaluation. Because children do not exist in one context or environment alone, ecologically sensitive and comprehensive cross-setting models of service such as CBC are essential. CBC addresses a void that other consultation approaches may not (e.g., home- or school-only consultation). The unique and important perspectives of health care providers, educational professionals, and parents are critical in developing comprehensive and cohesive treatments for children. Optimal services are possible when multiple systems collaborate and share in consistent planning and evaluation. School and other pediatric-oriented psychologists are in a unique position to coordinate such consultation services as they understand the unique demands of educational, medical, and family systems and are familiar with and competent in working collaboratively with other professionals in these settings.

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### Note

1. Because the primary emphasis of the project was training, rigorous experimental research designs were not imposed. A number of limitations are apparent with the case data reported, including lack of experimental control, variability in presenting target behaviors, coexisting interventions that vary across participants, and lack of reliability and objectivity in behavioral data. Thus, data are primarily descriptive and exploratory in nature, and results should be interpreted with caution.

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