

State of the Science in the Assessment and Management of Severe Behavior Problems in School Settings: Behavior Analytic Consultation to Schools

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Abstract

In school settings, behavior analysts are often called in to consult on severe behavioral issues that surpass the knowledge, experience, and training of local school personnel. Severe behavior such as aggression to staff, SIB, and property destruction are common severe behavior referrals. The benefits of functional assessments, functional analyses, preference assessments, treatment analyses, and generalization analyses have been well documented in school and clinic-based research. However, to date, a unified framework to guide behavior analysts through these best practices in school settings has not been proposed. Further, although theoretical models for school consultation have been proposed (viz., Direct Behavioral Consultation), no empirical case examples of existing models have been published. The current paper describes the Behavior Analytic Consultation to Schools (BACS) model, its application to severe behavior problems, and provides 2 case examples of the BACS model to solve difficult severe behavior referrals in school settings.

Keywords: Behavior Analytic Consultation to Schools (BACS), severe behavior, non-severe behavior, functional analysis

Children with developmental disabilities, severe cognitive impairments, mental retardation, and pervasive developmental disorders (e.g., autistic disorder) often demonstrate severe destructive behavior in school settings (Broussard & Northup, 1995; Foxx, 1982; Sasso & Reimers, 1988; Sasso, et al., 1992). Such behavior can have detrimental effects on those children, their peers, and on their classrooms as a whole (Ellis & Magee, 1999). Severe behavior such as aggression to staff, self-injury, and property destruction often lead to missed instructional time, physical injury to staff and peers, and to the use of invasive emergency procedures such as physical restraint (Burke, Hagan-Burke, & Sugai, 2003). The importance of reducing or eliminating destructive behavior in public school settings is obvious.

In this paper, we make a distinction early on between “severe” and “non-severe” behavioral referrals. Severe behavior, as discussed here, refers to behavior that is physically dangerous to a person or to those to whom a person’s behavior is directed. Examples include self-injurious behavior (SIB; head banging, head hitting, self biting, etc.), physical aggression to staff and peers (e.g., kicking punching, biting, etc.), and property destruction (e.g., breaking furniture, throwing chairs, etc.). Non-severe behavior common to classroom-based behavioral referrals refer to such behavior as noncompliance, disruption, getting out of one’s seat, teasing, bullying, name calling, not completing work assignments, and inattention to tasks, etc. The distinction between the two types of behavioral referrals described above is made in order to contrast severe behavioral issues against other disruptive but non-severe behavioral issues such that issues related to staff working with children who demonstrate severe behavior problems can be properly put into context. The importance of making such a distinction will be discussed later in this paper.

Much is known about the effective assessment and treatment of severe behavior in school settings. The applied behavior analysis literature is filled with many examples of functional assessment, treatment selection, and treatment evaluation of behavioral interventions in school settings (Cipani, 1999; Moore, Mueller, Dubard, Roberts, & Sterling-Turner, 2002; Mueller & Kafka, 2005; Mueller, Moore, & Sterling-Turner, 2005; Mueller, Wilczynski, Moore, Fusilier, & Trahan, 2001; Watson & Steege, 2003).

Very little emphasis in the behavioral community, however, has been placed on effective models of providing such services on a consultative basis. It has been the school psychology literature that has addressed consultative issues including theoretical models to guide experts or to train consultees (e.g., teachers) in activities that include data collection, graphical interpretation, conducting functional assessments, treatment implementation etc. (Gresham, 1991; Noell, Witt, Gilbertson, Ranier, & Freeland, 1997). Alternatively, the school psychology literature has focused less on the published application and empirical demonstration of these largely theoretical models. As such, a considerable gap in theory and practice exists between the models proposed by the school psychology literature and the demonstration of those procedures by behavior analysts. No thorough and comprehensive model has been discussed as best practice when behavioral consultants are called into a school to assess and treat severe destructive behaviors. However, through rigorous critique of the most common consultative model, Behavioral Consultation (BC; Bergen, 1977) researchers have laid the ground work for a comprehensive framework (Gresham, 1991; Mueller, Trahan, & DuBard, 2004; Noell, et al., 1997; Noell & Witt, 1996; Witt, Gresham, & Noell, 1996) of consultation with a focus on behavior analytic methods using direct implementation of procedures and teacher involvement rather than an over reliance on didactic consultative strategies and teacher training.

When school psychological models of consultation (BC; Bergen 1977; Conjoint Behavioral Consultation; Sheridan, Kratochwill, & Bergen, 1996; Direct Behavioral Consultation; Watson & Robinson, 1996) are held to the difficulty and potential dangerousness of severe behavioral referrals, many limitations exist, and each, at least in theory, falls short of addressing the behavior analysts' needs in school settings on three main points. First, no empirical analyses of the three models just listed have been published to support their effectiveness in severe behavioral referrals in schools. Second, because existing models focus almost exclusively on teacher training, regardless of the training methods used low implementation integrity by teachers is always a possibility. Third, each model above is described as a teacher training model and none address the important distinction between expert consultant implementation and teacher training. This is particularly unfortunate in cases involving the assessment and treatment of severe behavior which often requires a level of expertise beyond what many teachers can (or are willing to) provide. A comprehensive model that defines the state of the science in the assessment and treatment of severe behavioral issues in school settings is needed to guide behavior analysts through severe behavioral referrals. The Behavior Analytic Consultation to Schools (BACS) model seeks to address this need.

BACS is a comprehensive model of consultative service delivery which provides behavior analysts with a best-practice blueprint for assessing and treating severe problem behavior in school settings. As a service delivery model for severe behavioral consultation, BACS includes eight components: (a) functional behavioral assessment (FBA), (b) functional analysis, (c) treatment selection, (d) treatment evaluation, (e) teacher training, (f) evaluation of the teacher-implemented treatment, (g) generalization evaluations, and (h) assessment of social validity issues. Each of the aforementioned steps are conducted in a manner consistent with rigorous reliance on data collection, high treatment integrity, and by personnel trained in their implementation. The inclusion of teachers and other classroom staff throughout any portion of the consultative process is considered, but is not required until the moment at which consultees are required to implement an effective treatment in intervention and generalization evaluations.

The BACS model is rooted in the fundamental assumption that the assessment and treatment of severe behavior, from FBA through generalization evaluations, requires extensive training and expertise, often beyond what is typically available in a school setting (Bergan & Kratochwill, 1990; Kratochwill & Bergan, 1990; Noell & Witt, 1996; Watson & Robinson, 1996; Watson, Sterling, & McDade, 1997; Witt, et al., 1996). Typically, when behavior analysts, behavioral consultants, or school psychologists are invited in to consult on severe behavioral challenges, the expectation is often to collaborate with school

staff. However, recent research suggests that collaboration is often not looked upon very highly by teachers who have made requests for help (Wickstrom, 1995). In fact, from our personal experiences in the schools, teachers seem to prefer a consultative relationship where the consultant is more directive than collaborative. As such, in the BACS model the consultant's role becomes that of an expert in the assessment and treatment process. The consultant decides when, and to what extent consultees are trained to implement, assist, or to collaborate during any step throughout the entire consultative process. Serving as the expert and working collaboratively with classroom staff when needed, the consultant progresses through the eight steps in the model. The steps of the BACS follow a logical progression starting with the direct implementation of FBA, functional analysis, and treatment evaluation to ensure effectiveness. Teachers are then trained to implement the effective treatments via direct training methods and their implementation of the treatment is evaluated. Finally, generalization evaluations, and the evaluation of social validity issues follows.

It is now widely accepted that a functional approach to the assessment of severe behavior is best practice (NIH, 1989; Sasso & Reimers, 1988; Vollmer & Northup, 1995; U.S. Department of Health and Human Services, 1991). A functional approach is one in which, through the use of multiple methods, data are collected on the environmental events that make a target behavior more likely to occur in different situations and on variables that might reinforce the behavior (Iwata, Kahng, Wallace, & Lindberg, 2000; Mueller, 2005; Watson & Steege, 2003). A comprehensive functional assessment model for use in schools was recently proposed by Asmus, Vollmer, and Borrero (2002) and includes the use of the three main areas in which assessment data should be derived—indirectly, directly, and through the use of functional analysis.

The methodology for functional assessment in the BACS model are essentially those described by Asmus et al. Indirect methods (e.g., record review, rating scales, teacher interviews) have mixed outcome data in the literature when compared to the results of functional analyses (Arndorfer, Miltenberger, Woster, Rortvedt, & Gaffaney, 1994; Cunningham & O'Neill, 2000; Zarcone, Rogers, Iwata, Rouke, & Dorsey, 1991) but are typically included in FBAs. Information derived from indirect methods can help set up more natural or ecologically valid functional analysis conditions beyond their marginal usefulness for determining function directly.

Direct methods (e.g., ABC observations, narrative observations, scatterplots) combined with indirect data can be useful for forming hypotheses to test in functional analysis. However, given the dynamic nature of classrooms and of school staff, it is rare to observe severe behavior in a classroom situation in which only one potential reinforcer is present. Typically, multiple potential reinforcers are present simultaneously, making even the most astute observer of behavior left with more than one reasonable hypothesis to test in functional analysis. For example, if a student is at her desk and her teacher asks her to complete a task, the student may respond by hitting herself if the consequence for such behavior leads to her teacher removing the task. Simultaneous with the student escaping from the task, the teacher may also issue a reprimand or warning to the student with a statement such as "we don't hit ourselves during work time." In this example, either event (i.e., escape or attention) might reinforce the student's SIB without the other. Observing this situation countless times will not provide information about which of the two events is reinforcing the SIB. Functional analysis is the method to ferret out the independent effects of multiple variables that occur simultaneously in a classroom.

A functional analysis can be conducted by many different methods that include antecedent manipulations (Carr & Durand, 1985) or manipulations to an antecedent and a consequent event in either brief or extended formats (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994; Northup, et al., 1991). In a review article on published functional analysis data, school-based functional analyses made up more than 30% of all functional analysis data sets in the literature (Hanley, Iwata, & McCord, 2003). Although staff and teacher training evaluations to conduct functional analyses have been documented (Iwata,

Wallace, et al., 2000; Moore, Edwards, Sterling-Turner, 2002; Wallace, Doney, Mintz-Resudek, & Tarbox, 2004), school personnel who possess the knowledge and experience to conduct such potentially dangerous analyses without expert consultative support are rare. Training teachers on the procedures in order to facilitate the use of a teacher as a therapist might very likely increase the ecological validity of the assessment and produce different outcomes (Ringdahl & Sellers, 2000). The BACS model, however, requires that a consultant with expertise in functional analysis methods be present throughout the entire process in order to ensure safety, implementation integrity, and accurate data collection.

After a functional analysis is conducted and its results interpreted for functional relationships between target behaviors and specific contingencies of reinforcement, a treatment is selected (Martens, Eckert, Bradley & Ardoin, 1999). Specific choices for treatment are not determined solely by the outcomes of a functional analysis (Martens, et al.; Mueller, Edwards & Trahan, 2003). Many choices for intervention components exist and include extinction, differential reinforcement, functional communication training, and noncontingent reinforcement. Classroom parameters, teacher preference, and structural variables are considered (Martens, et al., 1999; Mueller, Edwards, et al; Northup, et al., 1994).

In the BACS model, consultants evaluate the selected treatment for effectiveness with high integrity prior to training staff on its implementation. This is required so as to ensure that treatment failure is not due to an inadequate treatment. Should the treatment later fail in the classroom, its failure would likely be due to poor teacher implementation, a variable that can be easily addressed through additional training (Moore, et al., 2002; Mueller, Piazza, et al.; 2003, Sterling Turner, Watson, & Moore, 2002). Demonstration of an effective treatment with high integrity is the only way to know the effects of the intervention (Gresham, 1989). Implementing a treatment without understanding the level of integrity at which it was implemented only allows one to infer whether a behavior was reduced, but not *why* it was reduced. For example, if a teacher is supposed to praise a child for demonstrating periods of no aggression at 5 min intervals, but delivers praise every 7 min, the effectiveness of the intervention as planned (i.e., praise every 5 min) is unknown regardless of how well or poorly the praise every 7 min intervention worked. For this reason, and to have documented success with an intervention that might not work if not implemented properly, in the BACS model expert consultants conduct the initial treatment evaluation. Additionally, and from a pragmatic perspective, teachers are not always compliant with requests to perform very simple tasks (Witt, et al., 1996). With this in mind, having effectiveness data on the intervention a consultant will be asking the teacher to implement can go a long way in demonstrating to administrators and others that, if performed a certain way, the recommended intervention is indeed effective.

Should the treatment evaluation fail during the analog analysis when implemented with high integrity, the consultants simply choose another intervention approach and test the new intervention in a new analog treatment evaluation. During the treatment evaluation process, consultants should consider comparing multiple potentially effective treatments in brief comparisons such as those described in Martens et al., (1999) and in Mueller, Edwards, et al., (2003). From such brief comparative evaluations, an effective treatment is chosen simultaneously as other, less effective treatment strategies are ruled out. This tactic can be especially useful when staff suggestions for behavior reduction are not in line with consultant suggested techniques. A data-based comparison arms the consultant with data highlighting the effectiveness of intervention recommendations that flow from behavioral research and theory. Comparative analyses that include less than optimal staff recommended strategies (e.g., sensory integration suggestions) allow the consultant to communicate to the staff that their suggestions will be evaluated and data will determine the most effective methods for ongoing use.

Once the treatment has been demonstrated effective by consultants, consultees are trained so that the consultant can shift responsibility back to those who are ultimately responsible for treatment

implementation on a daily basis, and generalized to all staff that might use it. Training is conducted using direct, hands-on, and empirically derived methods. These methods include modeling, rehearsal, role-play, and performance feedback (Iwata, Wallace, et al., 2000; Moore, et al, 2003; Mueller, Piazza, et al., 2003). In the BACS model a strict adherence to verbal didactic strategies is avoided because such methods have been found to be ineffective in almost every evaluation unless presented in a repeated format or coupled with directive hands-on techniques (Sterling-Turner, et al., 2002; Mueller, Piazza, et al.). After a treatment is demonstrated effective in a treatment evaluation when staff implements the intervention, the treatment is then tested for generalization across additional staff (if necessary) and location. The evaluations of effectiveness and integrity should occur in the referral environment when staff is implementing all aspects of the treatment independent of consultant feedback, cueing, or assistance. The evaluation of the treatment, if not implemented entirely independently by staff, will not be a true evaluation of staff ability to implement the treatment in the absence of the consultants. In certain situations, the same analysis could evaluate the staff implemented treatment evaluation and generalization evaluations if the staff implemented evaluation occurs in the referral environment.

After all assessments have been completed, treatments have been found effective, teachers have been trained in their implementation, and the effective treatments have been generalized across staff and setting, the classroom staff are now implementing the intervention the way the consultants trained them. Consultants then evaluate social validity issues related to the process, and make additional recommendations to the teachers regarding fading, maintenance, and reduction of data collection. Post-intervention acceptability measures are then conducted.

The BACS model is a comprehensive approach designed to guide behavioral consultants through a set of best practice procedures so that assessment and evaluative procedures are completed with integrity, treatments are effective, and outcomes are acceptable. The purpose of the present paper is to provide two case examples of severe behavior referrals that were completed using the BACS model. The case examples are presented back-to-back and thus the organization of the remainder of the paper is slightly different than is found in traditional reports in which the focus is concentrated on the procedures used to reduce the target behavior rather than on the process and approach to the reduction of such behavior. Specifically, each case example will be presented in terms of the methods and results for each phase of the BACS process to highlight the continuum of the approach.

Case Example 1

Participant and Setting

Bruce was a 10-year-old boy diagnosed with autism. He had an extensive naming and receptive language repertoire developed through years of discrete trials training. However, Bruce was extremely prompt dependent when demonstrating expressive language and only very rarely did he initiate verbal exchanges. He used no signs or picture exchanges at the beginning of the study. All communication was verbal, albeit prompted from adults. Bruce could follow simple and multi-step directives. Bruce was referred for assessment and treatment of severe aggression directed at his teachers.

It was reported that Bruce had extreme auditory sensitivity. To help limit the volume of auditory stimuli, Bruce wore form-fitting wax earplugs everyday at school throughout every aspect of the case study. Bruce's classroom consisted of six peers, a teacher, a teaching assistant, and a paraprofessional assigned to work one-on-one with Bruce. In addition to Bruce's classroom, a vacant classroom in the school was used for evaluation and training purposes. The vacant classroom contained chairs, tables, and school-related objects on shelves and wall space within the room.

FBA Methods

Behavioral consultants conducted record reviews (e.g., teacher journals, IEPs, teacher-collected behavioral data from the classroom, psychological assessments), teacher and parent interviews (i.e., The Functional Assessment Informant Record for Teachers; Edwards, 2002; Doggett, Mueller, & Moore, 2002), functional assessment rating scales (e.g., Motivation Assessment Scale; Durand & Crimmins, 1988), and direct classroom observations (i.e., narrative descriptive observations and “ABC” observations; Bijou, Peterson, & Ault, 1968) to generate hypotheses regarding environmental variables possibly maintaining Bruce’s aggression. Records were sent to the consultants in advance of entering the classroom. A phone interview was used to gather information from Bruce’s parents. All direct measures were completed during a one-day visit to the school.

FBA Results

Indirect assessment results suggested that aggression occurred in various settings during the day. A time out was used within the classroom in which Bruce was removed from work tasks contingent on aggression, suggesting a potential escape from demand function. Parent and teacher interviews revealed similar information suggesting a potential for an escape from demand function as well. Additionally, Bruce’s parents and teacher each reported that his most severe aggression occurred when people around him coughed or cleared their throats. Consequences for problem behavior included “calming him down” by giving access to preferred toys, delivering attention, changing activities, response blocking, and ignoring aggression. No consistent consequences were delivered. The location of Bruce’s school was more than 100 miles from the consultant’s office limiting the number of trips the school was willing to fund. As such, limited direct observation was decided in advance. During the only classroom observation allowed, no aggression was demonstrated. Working with the teacher, aggression was defined as punching, slapping, pushing, kicking, scratching, pulling hair, biting, or attempts to do any of the above even if those attempts were blocked. Hypotheses for Bruce’s aggression derived from the indirect methods included escape from demands, escape from sensory stimulation (e.g., coughing), and tangible reinforcement.

Functional Analysis Methods

All functional analysis conditions were based on those described by Iwata, et al., (1982/1994). All conditions for Bruce were 2 min due to the limited amount of time allotted for the consultation process and presented in an unused classroom at Bruce’s school. A behavioral consultant served as the therapist for all conditions. The data recorders used a frequency count within each 2-min condition for Bruce’s analysis. Each condition was followed by a 3- to 5-min break.

Attention. During this condition, Bruce was given the instructions, “You can do what you want; I have some work to do over here.” The therapist then turned away and began to read a book. No verbal attention was provided unless the target behavior was demonstrated. For each instance of target behavior, the therapist delivered a brief reprimand. For example, if Bruce hit the therapist, the therapist delivered attention such as, “you can’t do that, you’re going to hurt me, stopping trying to hit me” etc. After the attention was delivered, the therapist turned away from the child and began to read.

Escape from Academic Demands. During this condition, the therapist engaged Bruce with a high level of task demands in a task that was difficult for him according to teacher report. A three-step prompting procedure was used that included verbal, gestural, and physical prompts at 5-s intervals. Demonstration of target behavior led to a 20-s break from task demands. Following the 20-s break, the therapist delivered another task demand using the three-step prompting procedure.

Escape from Coughing. During this condition, the therapist began coughing and clearing her throat. Bruce’s aggression led to a 20-s break from the coughing. At the end of the 20-s break, the therapist began coughing again and the process repeated.

Tangibles. During this condition, Bruce was given access to a highly preferred activity or item for 2 min. The therapist then restricted the item. The therapist returned the item for 20 s following target behavior. The item was restricted after the end of the 20-s access period and the process repeated.

Control. During this condition, Bruce had noncontingent access to attention and to play items. The therapist engaged Bruce in traditional interactive play and delivered attention at least every 20 s. No programmed consequences were delivered for target behaviors.

Functional Analysis Results

Figure 1 depicts the functional analysis results for Bruce. As can be seen, with the exception of one small episode of aggression in the first tangibles condition, aggression occurred only in the escape from coughing sessions suggesting that his aggression was negatively reinforced by the cessation of coughing.

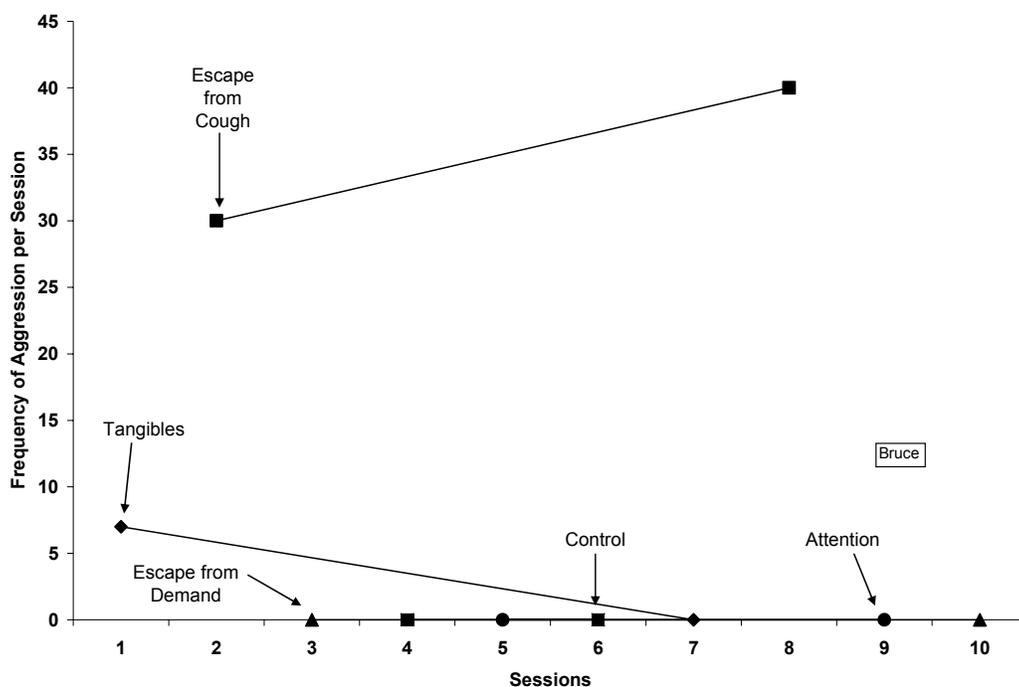


Figure 1. Functional analysis results for Bruce.

Analog Treatment Evaluation Methods

Bruce's educational goals and classroom procedures at the time of the functional assessment did not include any formalized methods of language instruction. As such, Bruce had no way to communicate his needs. To address this aspect of his education and to encompass his behavioral intervention components to reduce aggression into an integrated classroom system, the decision was made to try functional communication training (FCT) to eliminate aggression maintained by breaks from coughing.

Functional Communication Training and Evaluation. Prior to teaching the card exchange to end coughing (described below), baseline trials were conducted so that a comparison of the level of aggression could be made before and after the card exchange was trained. After the card exchange to end

coughing was trained and aggression was eliminated, Bruce did not independently exchange the card. That is, prompted card exchanges eliminated the aggression, but we did not want to discontinue this phase of the process until Bruce was independently exchanging the card. In an attempt to train a card exchange that might have demonstrated a more immediate exchange-reinforcer relationship, a card exchange that led to the delivery of a preferred tangible item was used. A multiple stimulus without replacement preference assessment (MSWO; DeLeon, & Iwata, 1996) was conducted with preferred candy items. Candy items were chosen through consultation with the teacher. A candy item was identified and used in the candy and mixed trial FCT sessions described below. All treatment analysis sessions were conducted in the vacant classroom. Again, behavioral consultants served the role of therapist.

Baseline. A therapist began coughing and clearing his/her throat and continued coughing and clearing his/her throat until aggression occurred. The therapist stopped making all noises contingent on aggression. No verbal statements were used. A trial ended following 5 s without aggression.

FCT: Break from Coughing. Bruce and a therapist were sitting at a table. Verbal directions were given explaining that a therapist would begin coughing and would only stop if the card was handed to him/her. A trial began when a therapist began coughing and clearing his/her throat as a card (printed with a stop sign and the word “stop”) was placed in front of Bruce. An independent exchange was scored if Bruce moved the card to the therapist so that the card made contact with the therapist’s hand without assistance within 5 s of the card presentation. If 5 s passed without Bruce exchanging the card, the card was placed in his hand and the therapist held his/her hand palm up pointing towards Bruce. A gestural prompt was scored if Bruce moved the card so that it made contact with the therapist’s hand within 5 s of the card placed in his hand. If more than 5 s elapsed, a second therapist physically guided the card exchange. No verbalizations occurred from the therapists during a trial.

Multiple Stimulus Without Replacement Preference Assessment. A multiple stimulus without replacement (MSWO) preference assessment was used to determine the relative preference of five candy items nominated by the teachers as being highly preferred to Bruce. Candy items included Laffy Taffy®, Hot Tamales®, Sweet Tarts®, peanut M&Ms®, and plain M&Ms®. Larger items were broken into smaller pieces so that all items were approximately the same size. All items were lined up in front of Bruce as the directive “pick one” was given. He had access to the candy he chose until it was swallowed (approximately 30 s). All remaining items were shuffled, lined up, and the process was repeated until all items were chosen. The complete selection process was repeated three times. Preferences were determined by calculating the percentage an item was selected from the number of trials in which that item was present in an array. Each item was selected three times. Three was divided by the number of trials an item was available in an array. For example, if a particular item was selected first in each of the assessments, 3 would have been divided by 3 equaling 100%.

FCT: Candy Access. Verbal directions were given explaining that Bruce could have a piece of candy (located in a dish in front of him) if he handed the card to the therapist. A trial began when a therapist placed a card (printed with a picture of candy) in front of Bruce as a small dish of candy was slid approximately 1 ft from his body. An independent exchange was scored if Bruce moved the card to the therapist so that the card made contact with the therapist’s hand without assistance within 5 s of the card presentation. If 5 s passed without Bruce exchanging the card, the card was placed in his hand and the therapist held his/her hand palm up pointing towards Bruce. A gestural prompt was scored if Bruce moved the card so that it made contact with the therapist’s hand within 5 s of the card placed in his hand. If more than 5 s elapsed, a second therapist physically guided the card exchange. No verbalizations occurred from the therapists during a trial.

Mixed Trial FCT. Trials began with both cards in front of Bruce. One card was functional during each trial. The functional card led to a break from coughing or a piece of candy (determined randomly prior to the trial). On trials in which the candy card was functional to obtain a piece of candy, the candy dish was presented in front of Bruce. On trials in which the break card was functional to stop the therapist from coughing, the therapist began coughing. An independent exchange was scored if Bruce moved the functional card to the therapist so that the card made contact with the therapist's hand without assistance within 5 s of card presentation. If no response was made in 5 s, the nonfunctional card was removed from the table and the therapist held out his/her hand palm up. If an exchange was made within 5 s, a gestural exchange was scored. If no exchange was made within 5 s, the therapist physically guided the response.

FCT Generalization Steps

After Bruce was independently exchanging the break from coughing card and aggression was eliminated during trials that were presented at the table, therapists moved away from the table and subsequently increased their distance from Bruce. After Bruce had to walk 15 ft to exchange the card with the coughing therapist, he was required to walk that distance to different locations in the room. Next, he was required to walk at least 5 ft in the opposite direction of the therapist to obtain the card from a table before walking to the therapist who was still at least 15 ft in the other direction.

Therapist 15 ft Away. The therapist was at least 15 ft from Bruce at the time the trial began. In order for Bruce to end coughing, he had to move to the therapist and hand him or her the card.

Therapist in New Locations. The therapist was at least 15 ft from Bruce at the time the trial began but in a different part of the classroom than in the previous trial. In order for Bruce to end coughing, he had to move to the therapist and hand the card.

Card 5 ft from Bruce. The therapist was at least 15 ft from Bruce and in a different part of the classroom than the previous trial. Prior to the start of the trial, the FCT card was dropped at least 5 ft from Bruce so that he had to retrieve the card before traveling the 15 ft to the coughing therapist in a different part of the room than the previous trial.

Analog Treatment Evaluation Results

Figure 2 depicts the results of the MSWO preference assessment used to identify a tangible item to positively reinforce a card exchange when Bruce continued not to demonstrate an independent card exchange to terminate coughing. Laffy Taffy was chosen most often.

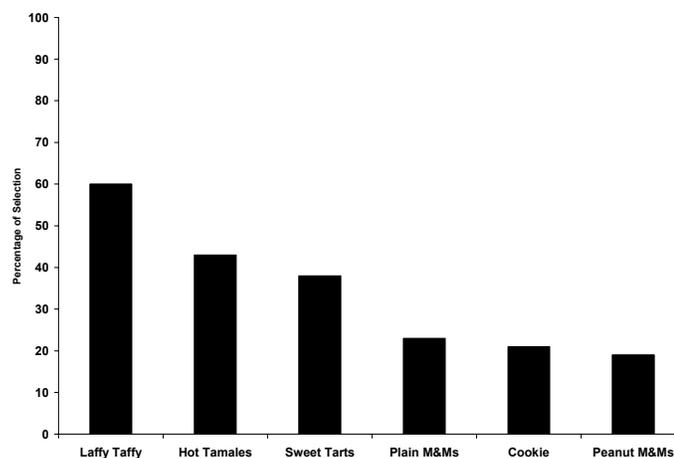


Figure 2. MSWO preference assessment results for Bruce.

Figure 3 depicts the results of the FCT treatment analysis with behavioral consultants in an unused classroom. As can be seen, baseline trials contained high levels of aggression when the aggression terminated coughing. With FCT, the aggression initially spiked before it was rapidly eliminated. A return to baseline resulted in a return to previous baseline levels of aggression. When FCT was again implemented, the aggression was eliminated. Interestingly however, even with the rapid elimination of the aggression using the card exchange, Bruce did not demonstrate an independent exchange until after the candy and the mixed trials were presented on Trial 70. With the exception of Trial 87, the aggression was eliminated through the generalization training steps.

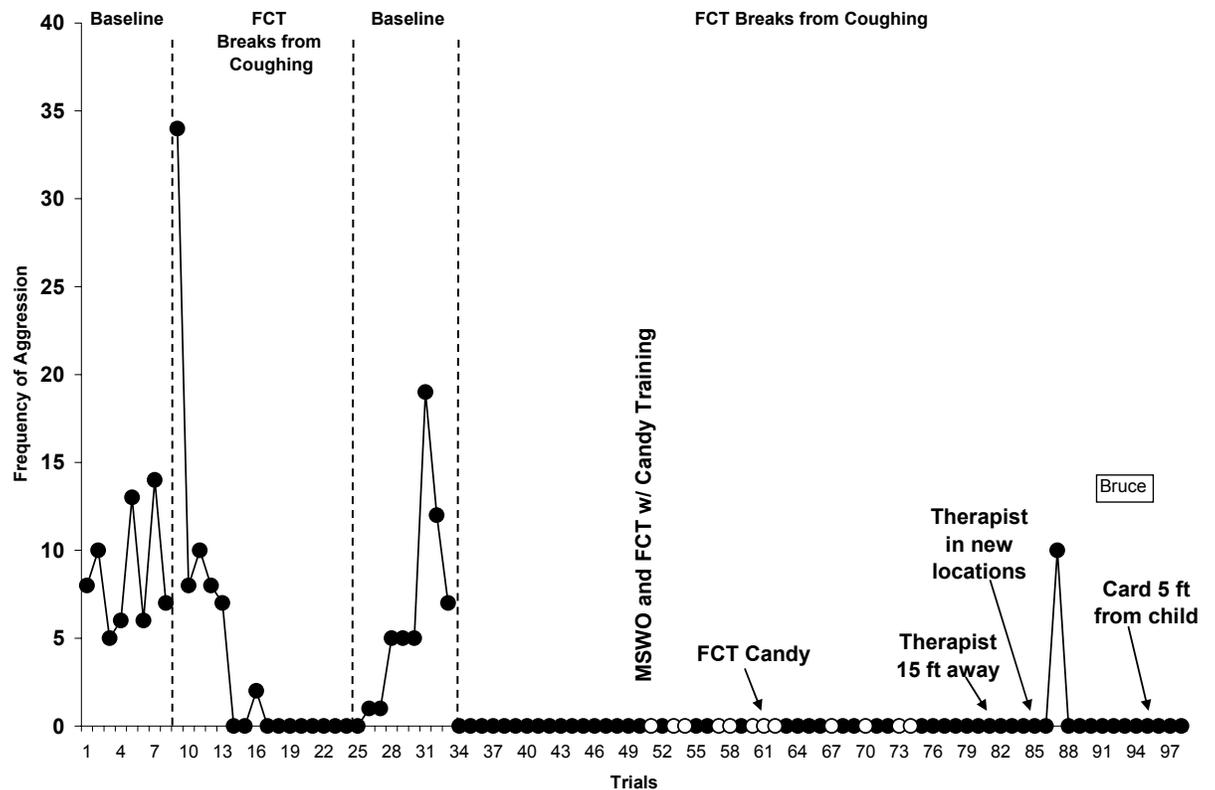


Figure 3. Frequency of aggression during Bruce's analog treatment analysis.

Teacher Training/Generalization Training Methods

Teacher training occurred following the consultant-implemented FCT evaluation. Consultants demonstrated the effectiveness of the card exchange. Modeling, role play with consultants, and post-trial performance feedback were used as instructional methods during teacher training. Each teacher's baseline and subsequent FCT evaluations followed the same sequence as described for the therapists above. First, training occurred at a table, then the teachers increased their distance to at least 15 ft from Bruce when the trials began, and finally concluded with trials presented in alternative settings (i.e., classrooms in which Bruce received instruction). Due to the previous demonstration of severe aggression with other therapists, shortened baselines were used.

Teacher Baseline. A teacher began coughing and clearing her throat and continued coughing and clearing her throat until aggression occurred. The teacher stopped making all noises upon aggression. No verbal statements were used. The trial ended with following 5 s without aggression.

FCT Break from Coughing. Teaching the card exchange to the teacher was identical to the procedures used with the therapists described above. Those procedures were as follows. Bruce and a teacher were sitting at a table. Verbal directions were given explaining that a teacher would begin coughing and would only stop if the card was handed to her. A trial began when a teacher began coughing and clearing her throat as a card (printed with a stop sign and the word “stop”) was placed in front of Bruce. An independent exchange was scored if Bruce moved the card to the teacher so that the card made contact with the teacher’s hand without assistance within 10 s of the card presentation. If 10 s passed without Bruce exchanging the card, the card was placed in his hand and the teacher held his/her hand palm up pointing towards Bruce. A gestural prompt was scored if Bruce moved the card so that it made contact with the teacher’s hand within 5 s of the card placed in his hand. If more than 5 s elapsed, the teacher physically guided the card exchange. No verbalizations occurred from the teacher or teacher during a trial.

Teacher FCT Generalization Steps

As described above for the card exchange used with the therapists, the teachers also participated in generalization evaluations. After the teachers were trained and aggression was eliminated at the table in the unused classroom, the card exchange was used when the teacher was at least 15 ft and then in their own classroom settings prior to follow-up data collection. Follow-up data collection was conducted in teachers’ classrooms.

Teacher 15 Feet Away. The teacher was at least 15 ft from Bruce at the time the trial began. In order for Bruce to end coughing, he had to move to the therapist and hand him or her the card.

Teacher in New Classroom. The teacher was at least 15 ft from Bruce and in the teachers’ own classroom.

Teacher Training/Generalization Results

Following the successful training of the FCT response in the unused classroom with behavioral consultants, teachers were trained in the analog setting before generalizing the intervention back to their respective classrooms. The results of the teacher-implemented intervention and generalization analyses are presented in Figure 4. For each teacher in baseline, a high frequency of aggression was demonstrated. Following baseline for each teacher, there was a total elimination of aggression throughout each generalization step in the unused classroom, the teacher’s own classrooms, and through out follow-up.

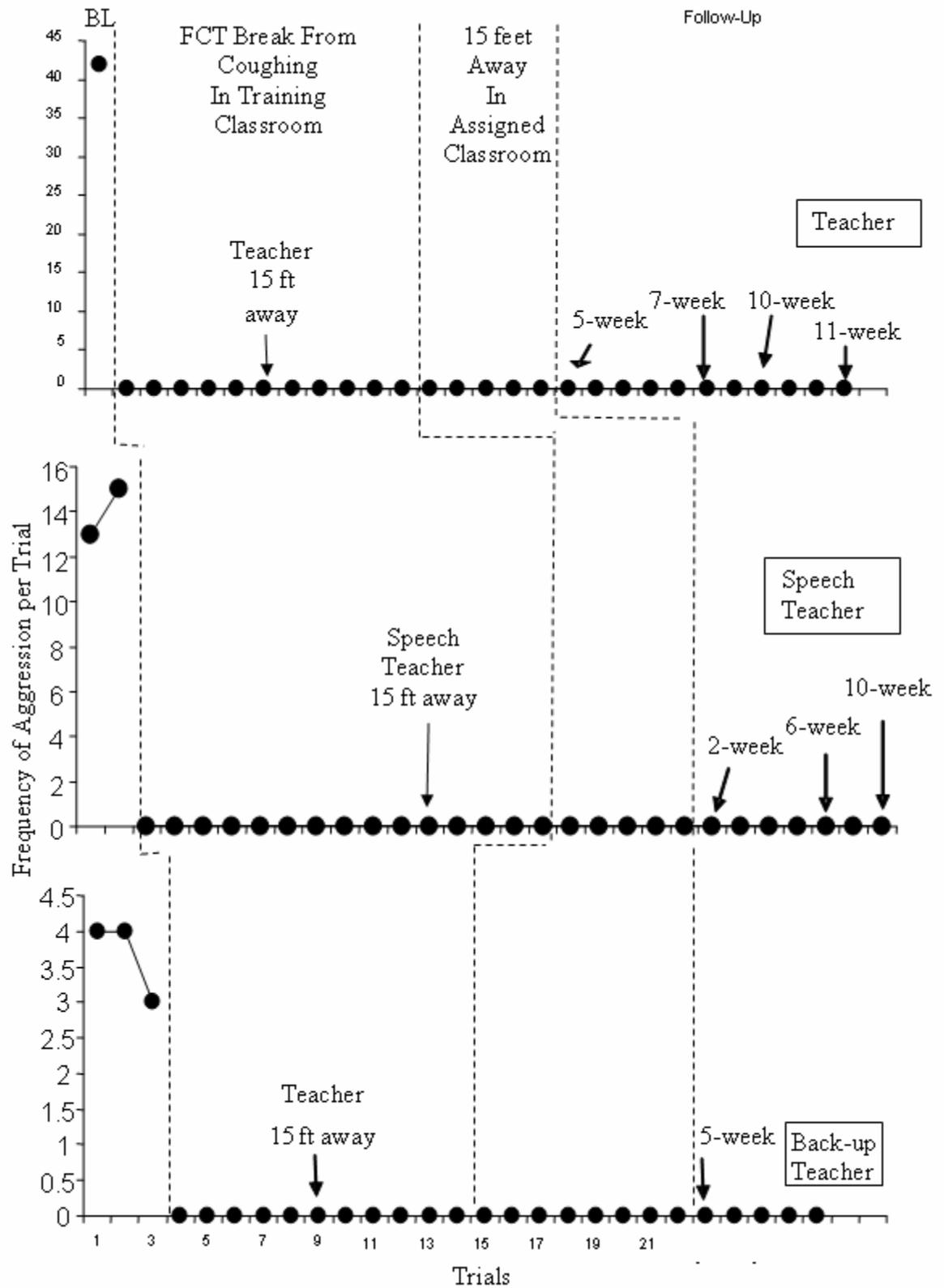


Figure 4. Frequency of aggression during teacher implemented treatment analysis and generalization trials for Bruce.

Social Validity Methods

Five teachers were given an IRP-15 (Martens, Witt, Elliott, & Darveaux, 1985) after the teacher training occurred. Three of the teachers were those represented in the teacher training depicted in Figure 4, and two others were teachers who were trained by Bruce’s staff following our consultation. The IRP-15 is a 15-item Likert-type scale that assesses general acceptability of interventions. Scores generated by the IRP-15 range from 15 to 90. Higher scores indicate better acceptance of interventions (Von Brock & Elliott, 1987). Ratings above 52.50 are typically considered to reflect acceptability of the intervention by the rater. Following treatment selection and treatment evaluation, teachers were shown the results of the evaluation and again completed an IRP-15 for the treatment evaluated in their classroom.

Social Validity Results

Five teachers (three teachers from Figure 5 and two additional teachers trained by Bruce’s lead teacher) were given the IRP-15 following their training. The IRP-15 results were as follows: 85, 82, 78, 88, 85 for Bruce’s teacher, speech teacher, back-up teacher and two additional teachers, respectively. The results suggest that the FCT intervention was viewed as highly acceptable by all teachers who were trained.

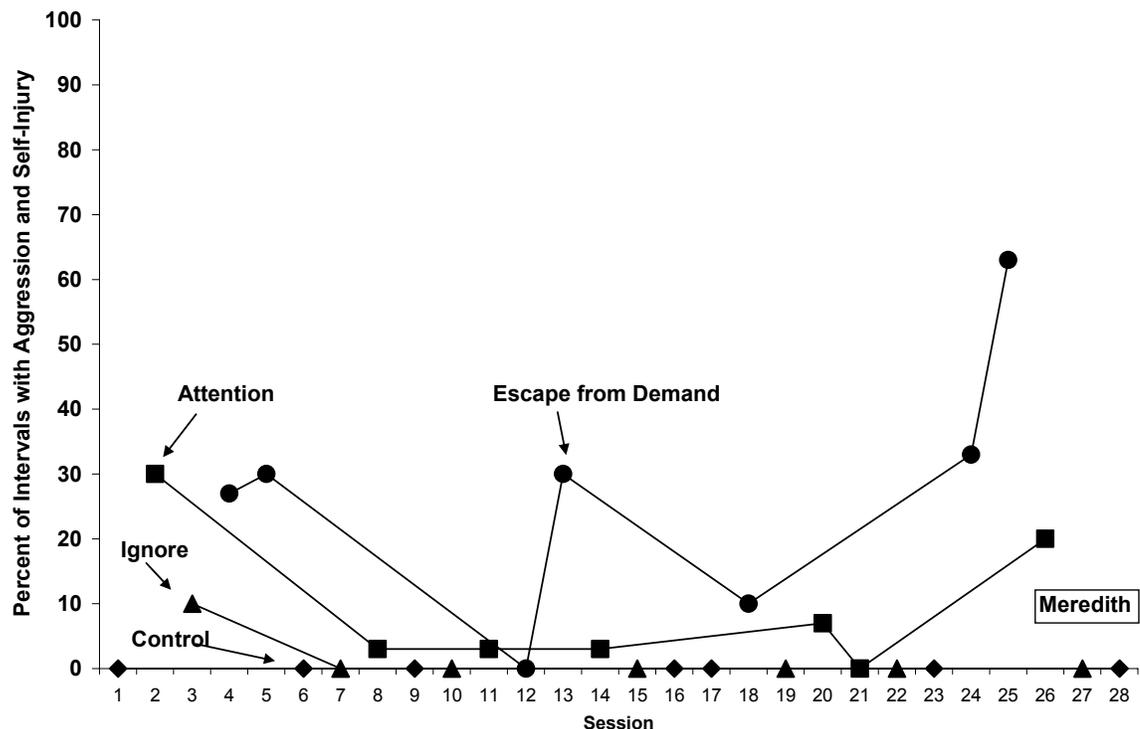


Figure 5. Functional analysis results for Meredith.

Discussion of Bruce's Case

After an FBA was completed on Bruce's aggression, results indicated that his aggression was maintained by the cessation of coughing. Tying a break-from-coughing card into a proposed card exchange system for use in the classroom was the strategy of choice to end the aggression. FCT was successful in eliminating the coughing in the unused classroom setting with behavioral consultants and teachers. In three different classrooms in which Bruce received instruction, the FCT was generalized and aggression was eliminated. Follow-up data collected for up to 3 months showed that the behavior had continued to be eliminated. Teachers participated in the gathering of FBA data, in treatment selection, in treatment evaluation, the training of others, and in generalization evaluations. The social validity and follow-up data may suggest that the process in which teachers were included, led to treatment choices and strategies that the teacher used and found acceptable using for months after the consultation process ended.

The choice to use FCT to end coughing was perhaps unusual and not immediately effective. During Bruce's day, even in the heart of the flu season, the reinforcer (no coughing) was present and available for the overwhelming majority of the time. That is, unless someone was coughing, Bruce was exposed to the reinforcer. Even though forced or gesturally prompted exchanges ended coughing and eliminated the aggression (see Figure 3), it was not until a tangible exchange was taught and then paired with the break from coughing exchange did Bruce ever hand the break card independently. Although, not evaluated in a controlled manner, the tangible positive reinforcer exchange may have facilitated the learning of the negative reinforcement exchange. In other words, the immediate tangible exchange might have taught Bruce that the break exchange may have immediate effects as well.

The use of 2-min functional analysis conditions is also unusual in the functional analysis literature. The decision to use the 2-min duration was based solely on the amount of time consultants were allotted to complete the evaluation. The strategy was to try short conditions and then increase the duration if no discernable differences were found. In our practice at Southern Behavioral Group, we typically use 5-min conditions and then increase to 10-min conditions if the results are flat or undifferentiated and variable. Short conditions like those used with Bruce have the potential for not capturing relevant motivating operations (Michael, 2000) within the analysis. That is, maybe Bruce could tolerate 2 min of being ignored, of difficult academic work, and of item restriction without aggression when maybe at 4 or 5 min he would have used the aggression to escape or access other reinforcers. If longer conditions were utilized, it might have revealed multiply maintained behavior. It has been suggested that verification of functional analysis results comes from applying a treatment based on the outcomes—effective treatment based on the results might suggest accurate results (Carr & Durand, 1985). However, the literature is replete with examples of intervention success when those interventions were not based on the function identified in the analysis. Examples of this include time out for escape behavior (Keeney, Fisher, Adelinis, & Wilder, 2000), tangible reinforcers for attention maintained behavior (Fischer, Iwata, & Mazaleski, 1997), and tangible reinforcer-based interventions for escape maintained behavior (Mueller, Edwards, et al., 2003). However, the validity of the findings that Bruce's aggression was negatively reinforced by the cessation of coughing is strengthened by the high levels of aggression in the shorter conditions, even though the possibility existed that other functions may not have been uncovered. This leads to a potential interpretive guide to validating results such that when behavior is high and differentiated in short conditions that those behaviors are most likely reinforced by the reinforcer in the condition, but when the behavior is low in short conditions, the possibility exists that other functions might be present. Further research into this outcome might be possible by extending the work of Kahng and Iwata (1999).

Case 2 Meredith

Meredith was a 15-year-old female diagnosed with profound mental retardation and autism. She was ambulatory with adult assistance, nonverbal, and could follow one-step instructions. She was enrolled in a special education classroom serving students with severe handicaps and was referred for the assessment and treatment of self-injurious behavior (SIB) and aggression. Meredith's SIB was defined as head slapping and hand biting. Her aggression was defined as pinching and scratching. Staff reported that both her SIB and aggression occurred intermittently throughout the day but were more likely when they attempted to present her with academic task demands. Meredith's classroom consisted of six peers, one teacher, and two paraprofessionals. A separate teacher work room/office, located inside of Meredith's classroom, was used as the training environment. Although Meredith was ambulatory with assistance, she was in a wheelchair for most of her day and was seated in a wheelchair through all aspects of the case study.

FBA Methods

Indirect FBA methods were employed and included record review (e.g., teacher journals, IEPs, teacher-collected behavioral data from the classroom, psychological assessments), teacher interviews (i.e., The Functional Assessment Informant Record for Teachers; Edwards, 2002; Doggett, et al., 2002), and functional assessment rating scales (e.g., Motivation Assessment Scale; Durand & Crimmins, 1988). Direct FBA methods included direct classroom observations (i.e., narrative descriptive observations and ABC observations; Bijou, et. al., 1968) which were used to identify the controlling variables of the target behaviors and to generate hypotheses regarding the function of Meredith's SIB and aggression.

FBA Results

Indirect assessment results suggested that aggression and SIB occurred across multiple settings, and were most likely to occur when demands were placed on Meredith. During the interviews, the teachers reported that activities such as placing envelopes in a mailbox, toileting, and transitioning off of the school bus might set the occasion for aggression and SIB. It was also reported that when Meredith engaged in aggression and SIB they would often provide her with some "quiet time" alone and away from the other students in order to "calm her down." Additionally, ABC data indicated that Meredith engaged in high rates of both aggression and SIB when presented with task demands and that these problem behaviors were frequently followed by the simultaneous consequences of escape from work and high levels of teacher attention. From the interviews and observational data, hypotheses for Meredith's aggression and SIB were negative reinforcement in the form of escape from task demands and positive reinforcement in the form of access to teacher attention.

Functional Analysis Methods

All functional analysis conditions were based on those described by Iwata, et al., (1982/1994). All conditions for Meredith were 5 min and presented in a small office within her classroom. A behavioral consultant served as therapist for all conditions. The data recorders used a 10-s partial-interval recording for Meredith. Each condition was followed by a 3- to 5-min break.

Attention. During this condition, a consultant was seated next to Meredith throughout the session. Meredith was given the instructions, "You can do what you want; I have some work to do." The therapist then turned away from her and began to read a book. No verbal attention was provided unless a target behavior was demonstrated. For each instance of target behavior, the therapist delivered a brief reprimand. For example, if Meredith hit the therapist, the therapist delivered attention such as, "you can't do that, you're going to hurt me, stopping trying to hit me" etc. After the attention was delivered, the therapist turned away from her and began to read.

Escape from Academic Demands. During this condition, the therapist engaged Meredith with a high level of task demands in a task that was difficult for her according to teacher report. A three-step prompting procedure was used that included verbal, gestural, and physical prompts at 5-s intervals. Demonstration of target behavior led to a 20-s break from task demands. Following the 20-s break, the therapist delivered another task demand and prompting procedure.

Ignore. During this condition, the therapist sat next to Meredith but provided no attention, demands, or consequence for target behaviors.

Control. During this condition, Meredith had noncontingent access to attention and to play items. The therapist engaged Meredith in traditional interactive play and delivered attention at least every 20 s. No programmed consequences were delivered for target behaviors.

Functional Analysis Results

Figure 5 depicts the functional analysis results for Meredith. As can be seen, the highest levels of aggression and SIB occurred in the escape from academic demand condition suggesting her SIB and aggression was negatively reinforced by breaks from work. A lower level occurred during attention sessions suggesting a possible positive reinforcement function as well.

Analog Treatment Evaluation Methods

Meredith's classroom situation was one in which food reinforcers were being used to motivate her appropriate transitioning from the bus to the in-class bathroom during her arrival at school. Based on the classroom teacher's preference to continue to use a similar intervention and for ease of training, a differential reinforcement of alternative behavior (DRA) procedure was used in conjunction with escape extinction to eliminate Meredith's aggression and SIB.

Stimulus Preference Assessment. A paired-stimulus preference assessment was conducted following the functional analysis using the procedures described by Fisher et al. (1992). Meredith was presented with randomized pairs of stimuli and was asked to select the one she wanted. When Meredith touched one of the two stimuli, the choice response was recorded. Meredith was then allowed to contact the stimulus for approximately 30 s. Five stimuli were assessed.

Following completion of the stimulus preference assessment, the effects of the delivery of preferred food items was evaluated. Meredith was exposed to a series of conditions initially in an analog setting with a trained behavioral consultant serving as therapist and subsequently in her natural classroom environment with the behavioral consultant, teacher and paraprofessional serving as therapists.

Baseline. This condition was identical to the escape from academic demands condition in the functional analysis. Meredith was presented with high levels of task demands. SIB and aggression resulted in the removal of task demands for 20 s.

Differential Reinforcement of Alternative Behavior and Escape Extinction (DRA + EE). Meredith was given a small piece of a potato chip following the completion of each task presented to her during each session. Potato chips were delivered following task completion even when she required physical prompting and regardless of whether or not she engaged in SIB or aggression. Meredith was given a task demand such as, "Meredith put the envelope in the box." The therapist waited 5 seconds for her to comply. If she complied, the therapist praised her and gave her access to potato chips. If she did not comply, the therapist repeated the verbal demand such as, "Meredith, put the envelope in the box like this" and demonstrated putting the envelope in the box. She was given an additional 5 seconds to comply. Compliance was followed by praise and access to the potato chips and noncompliance led to the final prompt. The final prompt used physical guidance with the verbal demand. Using minimal guidance

the therapist guided Meredith's hand to perform the task. If any target behaviors occurred during this condition, they were ignored and she continued to be prompted to complete the task.

Analog Treatment Evaluation Results

The highest ranking item from the preference assessment was potato chips as seen in Figure 6. Figure 7 depicts the results of the treatment evaluation. Meredith's behaviors were high during the baseline phases of the treatment analysis when she was allowed to escape from tasks following target behavior, revealing once more that allowing her to escape from tasks reinforced aggression and SIB. During the intervention phases of the treatment analysis when she was not allowed to escape from tasks and simultaneously given access to a preferred edible item such as potato chips, her problem behavior decreased.

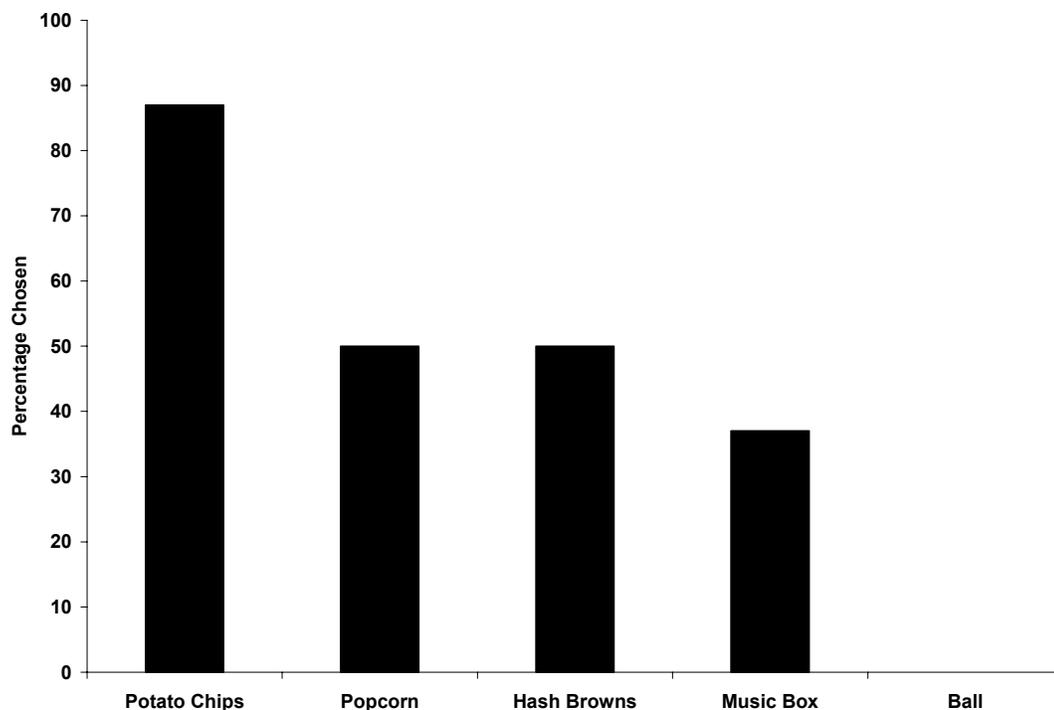


Figure 6. Paired-choice preference assessment results for Meredith.

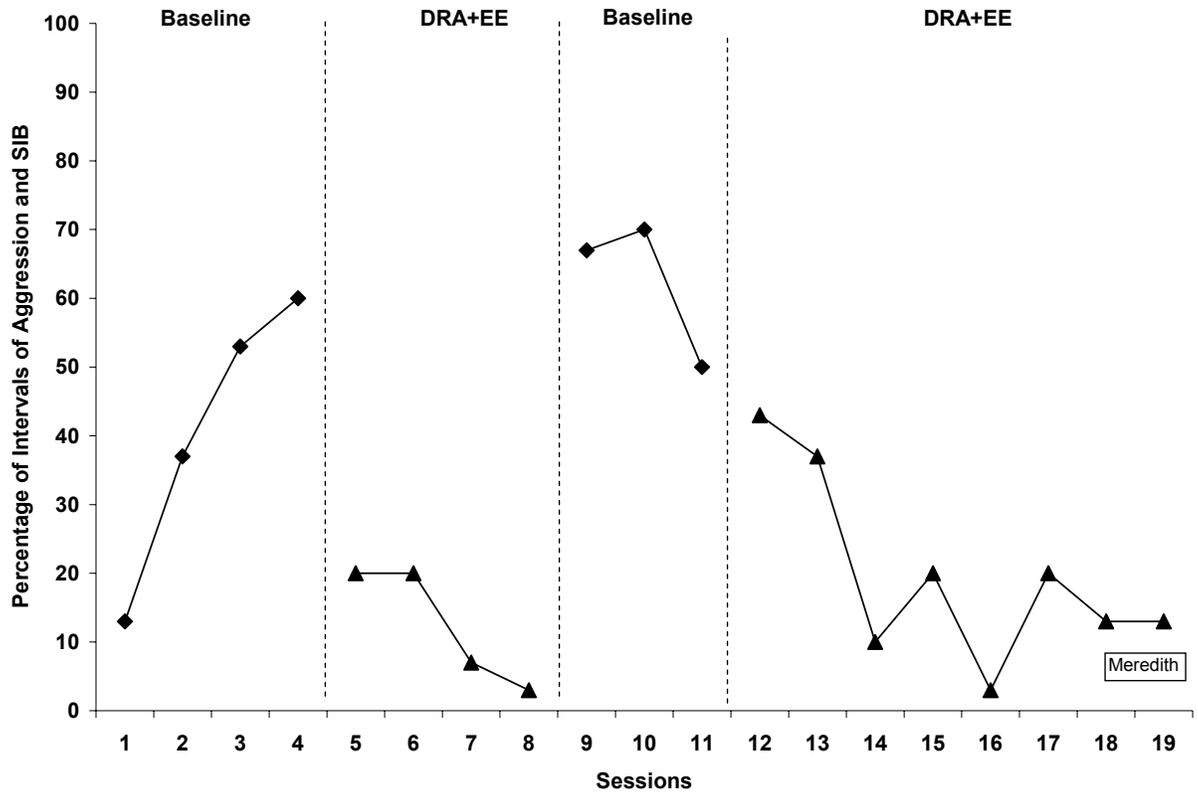
Teacher Training Methods

Figure 7. Percentage of intervals with aggression and SIB during Meredith's analog treatment analysis.

Teacher training occurred following the analog treatment analysis. During the training, both teachers participated in a 1-hr workshop. The workshop consisted of providing the teachers with a description and purpose of both the baseline and DRA + EE conditions employed during the analog treatment analysis, videotaped demonstration of the analog treatment analysis with Meredith, and role playing. Following role playing, the teachers answered questions pertaining to the DRA + EE condition. At the conclusion of the workshop, simulated analyses identical to those employed in the analog treatment analysis were conducted with the teachers and the consultants role-playing the part of Meredith. At the teacher's request, the simulated analyses as well as all subsequent treatment analyses were conducted in Meredith's natural classroom environment. During the simulated analyses, the teachers were evaluated on a ten-step protocol they were to follow for the purpose of treatment integrity. During the simulated analyses, the teachers had to obtain a score of 80% or better on correct on two consecutive sessions prior to being allowed to independently implement the treatment analysis in the participant's natural classroom environment.

Teacher Training Results

Treatment integrity data were generated by dividing the number of steps in the 10-step protocol implemented correctly, by the total number of steps (10) and multiplied by 100%. Results from Teacher 1 were 80% and 100% accuracy. Results for Teacher 2 were 100% and 100% across both sessions.

Generalization Training Methods

Following the successful training of the teachers during the workshop with behavioral consultants, the teachers subsequently attempted to replicate the treatment analysis conducted in the analog setting. A multiple baseline across teachers design was used to assess the efficacy of the trained teacher's use of DRA + EE on the participant's aggression and SIB in her natural classroom environment. Each teacher's baseline and subsequent DRA + EE evaluations followed the same sequence as described for the therapists in the analog treatment analysis.

Teacher Baseline. This condition was identical to the escape condition of the functional analysis. The teacher presented the participant with high levels of task demands. SIB and aggression resulted in a removal of task demands for 20 s.

Teacher Implemented DRA + EE. Identical to the conditions described above, using a three-step prompting sequence, the teachers provided the participant with access to potato chips following the completion of each task presented to her during each session. If any target behaviors occurred during this condition, they were ignored and the participant continued to be prompted to complete the task.

Generalization Results

The results of the treatment analysis following the teacher training with the teachers conducting the analysis in the participant's natural classroom environment are presented in Figure 8. For each teacher in baseline, a high frequency of aggression and SIB was demonstrated. Following baseline for each teacher, there was a significant reduction of aggression and SIB across teachers in the natural classroom environment.

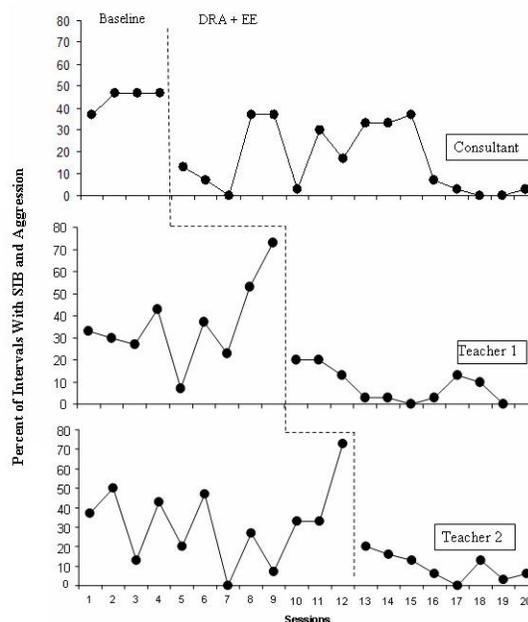


Figure 8. Percentage of intervals of aggression and SIB during teacher implemented treatment analysis and generalization evaluation.

Social Validity Methods

Two teachers were given an IRP-15 (Martens, et. al., 1985) after the teacher training occurred. The two teachers are those represented in the teacher training depicted in Figure 8.

Social Validity Results

Two teachers were given the IRP-15 following their training. The IRP-15 results were 73 for Meredith's teacher and 78 for her paraprofessional. The acceptability results suggest that the package intervention of DRA + EE in conjunction with escape extinction was viewed as highly acceptable by both teachers who were trained.

Discussion of Meredith's Case

In Meredith's case study we examined the extent to which the DRA when used in conjunction with EE would result in a decrease of SIB and aggression. Results of Meredith's functional analysis indicated that her SIB and aggression was maintained by negative reinforcement in the form of escape from task demands and by positive reinforcement from adult attention. After identifying the function of Meredith's SIB and aggression, a stimulus preference assessment was conducted based on procedures described by Fisher et al (1992) to identify specific items that might be utilized during an intervention designed to lessen the aversiveness of task demands. Following the stimulus preference assessment, a treatment evaluation was conducted. The treatment package consisted of DRA + EE (i.e., chips for compliance and three-step prompting) to facilitate compliance with completing vocational tasks.

At least two factors may have contributed to the success of the intervention package. First, compliance resulted in access to highly preferred items (potato chips) that had been identified through the stimulus preference assessment. Adding highly preferred items for task completion could have lessened the aversiveness of the task and reduced her motivation to use aggression and SIB to end the task (Carr & Durand, 1985). Second, the response-reinforcer relationship for SIB and aggression was disrupted by not allowing Meredith to escape the task through the use of the three-step prompting procedure. Although the specific components within the intervention package cannot be identified as being the sole contributor of the effective results, used together, the procedure was successful in eliminating the severe behavior. Future research could evaluate the separate effects of each of the interventions employed in this study across therapists and settings.

Discussion of the BACS Model

The state of the science in assessment and treatment of severe destructive behavior in the schools is a data-based continuum of service provision that spans from initial functional assessment interview through evaluating the social validity of the effective outcomes based on a series of regimented evaluations to ensure effectiveness and generalization. The BACS model prescribes functional behavioral assessment, functional analysis, treatment selection, treatment evaluation, teacher training, treatment evaluation with teachers implementing the procedures, generalization evaluation, and social validity assessments. Models and examples of best practice functional assessment (Asmus et al., 2002; Cone, 1997; Mueller, Sterling-Turner, & Scattone, 2001), functional analysis (Iwata, et al., 1982/1994) treatment selection (Martens et al. 1999; Mueller, Edwards et al. 2003), treatment evaluation (Mueller & Kafka, 2005), staff training (Iwata, Wallace, et al 2000, Moore et al., 2002, Mueller, Piazza, et al. 2003), generalization (Bird, Does, Moniz, & Robinson, 1989), and follow-up data collection (Noell et al. 2000) are in the literature. An empirically supported, research-based, comprehensive model for completing each of these processes in a unified theory is represented in the BACS approach to severe behavior consultation in a school system.

Other models of behavioral consultation have been practiced since Bergen's BC model was described in 1977. In the early 1990's, a series of very critical papers pointed out the limitations and weaknesses of the approach described by Bergen to change teacher and student behavior (Gresham, 1989; 1991; Noell & Witt, 1996; Witt et al., 1996). The main critique and limitations of BC centered on the complete reliance on ineffective verbal strategies of consultation and unsupported methods of teacher training (Witt, et al.). Pointing out that the model was never proven effective with data-based empirical evaluations after more than 15 years following its initial description, Witt et al. suggested that behavioral consultation to schools follow more behavioral analytic methods. It was from Witt et al.'s call for improvement to the BC model that the BACS model was derived and named.

A resultant spin-off from the BC model came 2 years after Witt et al.'s (1996) call for a better consultative model. Watson and Robinson (1996) described the DBC model of consultation and teacher training. Based on remediation of the didactic-only deficiencies in the BC model, the DBC model places a heavy reliance on better training methods and treatment integrity evaluation than was described in the BC approach (Watson & Robinson; Sterling-Turner & Watson, in press). The emphasis in DBC however, continues to be teacher *training* rather than direct consultant implementation of procedures by experts formally trained and experienced in the specific methods that are used. Only one empirical paper has been published in which teacher training followed the four-stage DBC model in a public school classroom (Mueller, Edwards, & LeBourgeois, 2000). Mueller et al. used the DBC approach to train teachers on reducing classroom noncompliance. No demonstrations of its use have been published with severe behavioral referrals. When severe behavioral consultation is placed within a model that relies on teacher training, several very important shortcomings are uncovered. Most importantly, in severe behavior referrals, our overwhelming experience in the schools suggests that teachers do not want to be trained in assessment methods they do not feel comfortable implementing without assistance. Some teachers are willing to be trained to serve the role as the therapist in a functional analysis, others are not. Regardless of the teacher willingness to *participate* in the assessment, the assumption that teachers should be trained to *conduct* intensive and potentially dangerous analyses is not based on what we consider to be a best practice approach to consultation. In non-severe behavioral referrals in which indirect or direct FBA methods make up the entire data collection process (e.g., a child who gets out of their seat during class), reliance on teacher collected FBA data might be considered. However, in severe behavior referrals, training teachers to conduct the analyses would require specific teaching on the principles of reinforcement, motivating operations, logic of single case design and time series methodology, interpreting single case design outcomes, different formats of data collection, aspects of graphing results for interpretive purposes, physical management of severe behavior such as blocking hits, bites, kicks, and hair pulls, etc. Other training might include selection of materials for inclusion in different experimental conditions (e.g., selection of academic tasks), conducting preference assessments, setting up part of a classroom for the analysis, explanation of the potential confounds to each condition, and more. Clearly, reliance on teacher training to allow special educators to conduct what might be considered "typical" functional analyses can pose a time consuming, logistical, and possibly even ethical issues for the consultant.

Beyond the amount of training that would have to occur on this one aspect of the assessment, several pragmatic considerations pose barriers to a pure training model such as BC and DBC. For instance, what do consultants relying on a teacher training model of consultation do when teachers refuse to be trained? What is the route taken when teachers' fear, lack of time away from their classroom and other students, inattention to precise detail during training, and administrator preference for real expertise preclude teachers from being trained or participating in a collaborative consultation process? None of these questions have been addressed in the BC or DBC model in theory or in practice.

The answers to the above questions allow consultants who use the BACS model wide berth in terms of case-by-case decision making. For example, if a consultant and teacher decide that the teacher

does not have the motivation or confidence to participate as the therapist in the functional analysis, the consultant can find someone else to serve the role or serve the role him or herself. If the teacher wants to participate, the BACS model allows for that training to occur so that maximum teacher involvement is possible. From personal experiences in school settings, it is very obvious that many teachers want to help in different aspects of the process, and many do not. In both situations, efforts are made in the BACS model to ensure that the assessment-to-treatment process is implemented with as much participation as the situation allows.

When behavioral referrals are made to reduce very serious and dangerous behaviors in school settings, the BACS model provides a framework for consultants to follow to ensure a best-practice approach to the assessment of those behaviors, the interventions based from those assessments, the training and evaluation of others who implement those treatments, followed-by evaluation of the treatment across settings and staff. The BACS model represents an approach that was supported by the case examples described above. As further refinement of the process presents itself, additional research and case examples might shape the model over time. Currently, the state of the science in severe behavioral referrals in school settings is a comprehensive set of best practice procedures conducted through an expert model of consultation directed by those who have the most experience and expertise in the area of applied behavior analysis.

References

- Arndorfer, R. E., Miltenberger, R. G., Woster, S. H., Rortvedt, A. K., & Gaffaney, T. (1994). Home-based descriptive and experimental analysis of problem behaviors in children. *Topics in Early Childhood Special Education, 14*, 64-87.
- Asmus, J. M., Vollmer, T. R., & Borrero, J. C. (2002). Functional behavioral assessment: A school-based model. *Education and Treatment of Children, 25*, 67-90.
- Bergan, J. R. (1977). *Behavioral consultation*. Columbus, OH: Merrill.
- Bergan, J. R., & Kratochwill, T. R. (1990). *Behavioral consultation and therapy*. New York: Plenum.
- Bijou, S. W., Peterson, R. F., & Ault, M. H. (1968). A method to integrate descriptive and experimental field studies at the level of data and empirical concepts. *Journal of Applied Behavior Analysis, 1*, 175-191.
- Bird, F., Dores, P. A., Moniz, D., & Robinson, J. (1989). Reducing severe aggressive and self-injurious behaviors with functional communication training. *American Journal on Mental Retardation, 94*, 37-48.
- Broussard, C. D., & Northup, J. (1995). An approach to functional assessment and analysis of disruptive behavior in regular education classrooms. *School Psychology Quarterly, 10*, 151-164.
- Burke, M. D., Burke-Hagan, S., & Sugai, G. (2003). The efficacy of function-based interventions for students with learning disabilities who exhibit escape-maintained problem behaviors: Preliminary results from a single-case experiment. *Learning Disability Quarterly, 26*, 15-25.

- Carr, E. G., & Durand, V. M. (1985). Reducing behavior problems through functional communication training. *Journal of Applied Behavior Analysis, 18*, 111-126.
- Cipani, E. (1999). *A functional analysis of behavior (FAB) model for school settings*. Visalia, CA: Cipani & Associates.
- Cone, J. D. (1997). Issues in functional analysis in behavioral assessment. *Behavioral Research & Therapy, 35*, 259-275.
- Cunningham, E., & O'Neill, R. E. (2000). Comparison of results of functional assessment and analysis methods with young children with autism. *Education and Training in Mental Retardation and Developmental Disabilities, 35*, 406-414.
- DeLeon, I. G. & Iwata, B. A. (1996). Evaluation of a multiple-stimulus presentation format for assessing reinforcer preferences. *Journal of Applied Behavior Analysis, 29*, 519-532.
- Doggett, R. A., Mueller, M. M., & Moore, J. W. (2002). Functional assessment informant record for teachers: Creation, evaluation, and future research. *Proven Practice: Prevention and Remediation Solutions for Schools, 4*, 25-30.
- Durand, V. M., & Crimmins, D. B. (1988). Identifying the variables maintaining self-injurious behavior. *Journal of Autism and Developmental Disorders, 18*(1), 99-117.
- Edwards, R. P. (2002). Functional Assessment Informant Record for Teachers. *Proven Practice: Prevention and Remediation Solutions for Schools, 4*, 15-24.
- Ellis, J., & Magee, S. K. (1999). Determination of environmental correlates of disruptive classroom behavior: Integration of functional analysis into public school assessment process. *Education and Treatment of Children, 22*, 291-316.
- Fischer, S. M., Iwata, B. A., & Mazaleski, J. L. (1997). Noncontingent delivery of arbitrary reinforcers as treatment for self-injurious behavior. *Journal of Applied Behavior Analysis, 30*, 239-249.
- Fisher, W., Piazza, C. C., Bowman, L. G., Hagopian, L. P., Owens, L. C., & Slevin, I. (1992). A comparison of two approaches for identifying reinforcers for persons with severe and profound disabilities. *Journal of Applied Behavior Analysis, 25*, 491-498.
- Foxx, R. M. (1982). *Decreasing behaviors of persons with severe retardation and autism*. Champaign, Illinois: Research Press.
- Gresham, F. M. (1991). Whatever happened to functional analysis in behavioral consultation? *Journal of Educational and Psychological Consultation, 2*, 387-392.
- Gresham, F. M. (1989). Assessment of treatment integrity in school consultation and prereferral intervention. *School Psychology Review, 18*, 37-50.

- Hanley, G. P., Iwata, B. A., & McCord, B. E. (2003). Functional analysis of problem behavior: A review. *Journal of Applied Behavior Analysis, 36*, 147-185.
- Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1994). Toward the functional analysis of self-injury. *Journal of Applied Behavior Analysis, 27*, 197-209. (Reprinted from *Analysis and Intervention in Developmental Disabilities, 2*, 3-20, 1982).
- Iwata, B. A., Kahng, S., Wallace, M. D., & Lindberg, J. S. (2000) The functional analysis model of behavioral assessment. In J. Austin & J. E. Carr (Eds.), *Handbook of Applied Behavior Analysis*. Reno, NV: Context Press.
- Iwata, B. A., Wallace, M. D., Kahng, S., Lindberg, J. S., Roscoe, E. M., Conners, J., et al. (2000). Skill acquisition in the implementation of functional analysis methodology. *Journal of Applied Behavior Analysis, 33*, 181-194.
- Kahng, S. W., & Iwata, B. A. (1999). Correspondence between outcomes of brief and extended functional analyses. *Journal of Applied Behavior Analysis, 32*, 149-159.
- Keeney, K. M., Fisher, W. W., Adelinis, J. D., & Wilder, D. A. (2000). The effects of response cost in the treatment of aberrant behavior maintained by negative reinforcement. *Journal of Applied Behavior Analysis, 33*, 255-258.
- Kratochwill, T. M., & Bergan, J. R. (1990). *Behavioral consultation in applied settings: An individual guide*. New York: Plenum Press.
- Martens, B. K., Eckert, T. L., Bradley, T. A., & Ardoin, S. P. (1999). Identifying effective treatments from a brief experimental analysis: Using single-case design elements to aid decision making. *School Psychology Quarterly, 14*, 163-181.
- Martens, B.K., Witt, J.C., Elliot, S.N., & Darveaux, D. (1985). Teacher judgements concerning the acceptability of school based interventions. *Professional Psychology, 16*, 191-198.
- Michael, J. (2000). Implications and refinements of the establishing operation concept. *Journal of Applied Behavior Analysis, 33*, 401-410.
- Moore, J. W., Edwards, R. P., Sterling-Turner, H. E., Riley, J., Dubard, M., & McGeorge, A. (2002). Teacher acquisition of functional analysis methodology. *Journal of Applied Behavior Analysis, 35*, 73-77.
- Moore, J. W., Mueller, M. M., Dubard, M., Roberts, D. S., & Sterling-Turner, H. E. (2002). The influence of therapist attention on self-injury during a tangible condition. *Journal of Applied Behavior Analysis, 35*, 283-286.
- Mueller, M. M., (2005). *Functional Analysis*. In T. S. Watson and C. H. Skinner (Ed.s.). *Encyclopedia of School Psychology*. Kluwer
- Mueller, M. M., Edwards, R. P., and LeBourgeois, M. (2000). Using direct behavioral consultation to train multiple teachers in effective instruction delivery to increase compliance in the classroom. *Proven Practice: Prevention and Remediation Solutions for Schools, 3*, 3-8.

- Mueller, M. M., Edwards, R. P., & Trahant, D. (2003). Translating multiple assessment techniques into an intervention selection model for classrooms. *Journal of Applied Behavior Analysis, 36*, 563-573.
- Mueller, M. M., & Kafka, C. (2005). Assessment and treatment of object mouthing in a public school classroom. *Behavioral Interventions, 21*, 137-154.
- Mueller, M. M., Moore, J. W., & Sterling-Turner, H. E. (2005). Towards developing a classroom-based functional analysis condition to assess escape-to-attention as a variable maintaining problem behavior. *School Psychology Review, 34*, 425-431.
- Mueller, M. M., Piazza, C. C., Moore, J. W., Kelley, M. E., Bethke, S., Pruett, A., & Oberdorff, A. (2003). Training parents to implement pediatric feeding protocols. *Journal of Applied Behavior Analysis, 36*, 545-562.
- Mueller, M. M., Sterling-Turner, H. E., & Scattone, D. (2001). Functional assessment of hand flapping in a general education classroom. *Journal of Applied Behavior Analysis, 34*, 233-236.
- Mueller, M. M., Trahant, D. M., & DuBard, M. (2005). Behavioral Consultation. In T. S. Watson & C. S. Skinner (Ed.s). *The Comprehensive Encyclopedia of School Psychology*.
- Mueller, M. M., Wilczynski, S. M., Moore, J. W., Fusilier, I., & Trahant, D. (2001). Antecedent manipulations in a tangible condition: The effects of stimulus preference on aggression. *Journal of Applied Behavior Analysis, 34*, 237-240.
- National Institutes of Health, Consensus Development Panel on Destructive Behaviors in Persons with Developmental Disabilities. (1989). *Treatment of destructive behavior in persons with developmental disabilities* (NIH Publication No. 91-2410). Bethesda, MD: U.S. Department of Health and Human Services.
- Noell, G. H., Witt, J. C., Gilbertson, D. N., Ranier, D. D., & Freeland, J. T. (1997). Increasing teacher intervention implementation in general education settings through consultation and performance feedback. *School Psychology Quarterly, 17*, 47-77.
- Noell, G. H., Witt, J. C., LaFleur, L. H., Mortenson, B. P., Ranier, D. D., & LeVelle, J. (2000). Increasing intervention implementation in general education following consultation: A comparison of two follow-up strategies. *Journal of Applied Behavior Analysis, 33*, 271-284.
- Noell, G. H., & Witt, J. C. (1996). A critical re-evaluation of five fundamental assumptions underlying behavioral consultation. *School Psychology Quarterly, 11*, 189-203.
- Northup, J., Wacker, D. P., Berg, W. K., Kelly, L., Sasso, G., & DeRaad, A. (1994). The treatment of severe behavior problems in school settings using a technical assistance model. *Journal of Applied Behavior Analysis, 27*, 33-47.
- Northup, J., Wacker, D., Sasso, G., Steege, M., Cigrand, K., Cook, J., et al. (1991). A brief functional analysis of aggressive and alternative behavior in an outclinic

- Setting. *Journal of Applied Behavior Analysis*, 24, 509-522.
- Ringdahl, J. E., & Sellers, J. A. (2000). The effects of different adults as therapists during functional analyses. *Journal of Applied Behavior Analysis*, 33, 247-250.
- Sasso, G. M., Reimers, T. M., Cooper, L. J., Wacker, D., Berg, W., Steege, M., et al. (1992). The use of descriptive and experimental analyses to identify the functional properties of aberrant behavior in school settings. *Journal of Applied Behavior Analysis*, 25, 809-821.
- Sasso, G. M., Reimers, T. M. (1988). Assessing the functional properties of behavior: implications and applications for the classroom. *Focus on Autistic Behavior*, 3, 1-15.
- Sheridan, S. M., Kratochwill, T. R., & Bergan, J. R. (1996). *Conjoint behavioral consultation: A procedural manual*. New York: Plenum Press.
- Steege, M. W., Wacker, D. P., Berg, W., Cigrand, K. K., & Cooper, L. J. (1989). The use of behavioral assessment to prescribe and evaluate treatments for severely handicapped children. *Journal of Applied Behavior Analysis*, 22, 23-33.
- Sterling-Turner, H. E., Watson, T. S. (in press). *Direct behavioral consultation*. In A. Thomas & J. Grimes (Eds.), *Best Practices in School Psychology*. National Association of School Psychologists, Baltimore, MD.
- Sterling-Turner, H. E., Watson, T. S., & Moore, J. W. (2002). The effects of direct training and treatment integrity on treatment outcomes in school consultation. *School Psychology Quarterly*, 17, 47-77.
- U.S. Department of Health and Human Services (1991). *Treatment of destructive Behaviors in persons with developmental disabilities* (NIH Publication No. 91-2410). Bethesda, MD: National Institutes of Health.
- Vollmer, T. R., & Northup, T. R. (1995). Some implications of functional analysis for school psychology. *School Psychology Quarterly*, 11, 76-92.
- Von Brock, M. B., & Elliott, S. N. (1987). Influence of treatment effectiveness information on the acceptability of classroom interventions. *Journal of School Psychology*, 25, 131-144.
- Wallace, M. D., Doney, J. K., Mintz-Resudek, C. M., & Tarbox, R. (2004). Training educators to implement functional analyses. *Journal of Applied Behavior Analysis*, 37, 89-92.
- Watson, T. S., & Steege, M. (2003). *Conducting school-based functional behavioral assessments: A practitioner's guide*. New York: The Guilford Press.
- Watson, T. S., & Robinson, S. L. (1996). Direct behavioral consultation: An alternative to traditional behavioral consultation. *School Psychology Quarterly*, 11, 267-278.
- Watson, T. S., Sterling, H. E., & McDade, A. (1997). Demythifying behavioral consultation. *School Psychology Review*, 26, 467-474.
- Wickstrom, K. (1995). *A study of the relationship among teacher, process, and outcome*

variables within school-based consultation. Unpublished doctoral dissertation, Louisiana State University, Baton Rouge.

Witt, J. C., Gresham, F. M., & Noell, G. H. (1996). What's behavioral about behavioral consultation? *Journal of Educational and Psychological Consultation*, 7, 327-344.

Zarcone, J. R., Rodgers, T. A., Iwata, B. A., Rourke, D., & Dorsey, M. F. (1991). Reliability analysis of the Motivation Assessment Scale: A failure to replicate. *Research in Developmental Disabilities*, 12, 349-360.

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