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Correspondence Between Teacher-Conducted Trial-Based Functional Analyses and Traditional Functional Analyses with High-School Aged Students

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CORRESPONDENCE BETWEEN TEACHER-CONDUCTED TRIAL-BASED FUNCTIONAL ANALYSES AND TRADITIONAL FUNCTIONAL ANALYSES WITH HIGH-SCHOOL AGED STUDENTS

by

Tashina M. Meaker

A thesis submitted in partial fulfillment
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ABSTRACT

Correspondence Between Teacher-Conducted Trial-Based Functional Analyses and Traditional Functional Analyses with High-School Aged Students

by

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Severe problem behavior may interfere with the education of children as well as cause serious injury to person and property. This study examined the correspondence of results obtained from trial-based and standard functional analyses for identifying function of problem behavior with high-school aged students. This study also examined the feasibility of school personnel conducting trial-based functional analyses within the classroom environment with procedural integrity. School personnel conducted four trial-based functional analyses with three high-school aged students referred for problem behavior. One student had two topographies of problem behavior assessed. The trials were interspersed throughout the school day. Results of the trial-based functional analyses were compared with results from standard functional analyses conducted by trained graduate students to show correspondence, or lack thereof between assessment results. Two cases showed correspondence between the two assessments. Two participants showed partial correspondence, which was attributed to limited exposure to

contingencies during the brief trials in the trial-based functional analyses as well as differences in the analysts' opinion of function depicted by the data. These results indicate that a trial-based functional analysis may be a viable assessment tool when school personnel lack the resources needed to complete a standard functional analysis. Two teachers and a paraprofessional were able to conduct trial-based functional analyses with high procedural integrity. Future direction of trial-based assessment research is discussed.

(77 pages)

PUBLIC ABSTRACT

Correspondence Between Teacher-Conducted Trial-Based Functional Analyses and Traditional Functional Analyses With High School Aged Students

by

Tashina M. Meaker

Tashina Meaker, in conjunction with Utah State University aims to study the correspondence of results obtained from trial-based and standard functional analyses for identifying function of problem behavior with high school age students as well as to examine the feasibility of classroom personnel conducting trial-based functional analyses within the classroom environment with procedural integrity. Results from this study may be reviewed by practitioners who are in need of accessible methods of functional analyses and whom wish to conduct trial-based functional analyses in applied settings. Based on the limitations presented in this study, areas of future research needed regarding trial-based functional analysis in applied settings will be suggested. All of the research will be conducted in the school setting of the participants. All of the school personnel and graduate students will conduct research during the natural school day. All materials that will be used for the research will come from the classroom of the participants. School personnel are paid for their normal contracted hours through the school district of the participants. Graduate students will donate their time spent on this study in conjunction with university requirements to participate in research. Therefore no additional costs will be necessary to run this study.

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Tashina Meaker

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INTRODUCTION

Challenging problem behavior such as aggression, self-injury and extreme tantrums are prevalent among children with developmental and intellectual disabilities (Duker, van Druenen, Jol, & Oud, 1986; Harris, 1993; Oliver, Murphy, & Corbett, 1987; Sigafoos, Elkins, Kerr & Attwood, 1994). Students with disabilities and long histories of severe problem behavior can present challenges for educators as well as other service personnel. When ordinary classroom systems of behavior management fail, often students are exposed to extensive interventions and more restrictive placements and contingencies are put in place (Dunlap, Kern-Dunlap, Clarke, & Robbins, 1991).

Sigafoos and Saggers (1995) posited that knowledge of the controlling variables may narrow the range of effective interventions to treat problem behavior as well as identify functionally equivalent alternative responses (which may reduce problem behavior). As noted by Van Houten et al. (1988), a general consensus is that a prior assessment that identifies the variables controlling severe problem behavior should be part of the intervention process. Once, the function of problem behavior is determined, relevant consequences and their associated discriminative stimuli and establishing operations may be adjusted to reduce problem behavior (Hanley, Iwata, & McCord, 2003).

There are many methods to identify function of problem behavior (Hanley et al., 2003). Early abstract analyses (Bachman, 1972; Carr, 1977; Smolev, 1971) suggested that problem behavior, such as self-injurious behavior (SIB) might be the result of reinforcement contingencies that differed across individuals who displayed these behaviors. However, methods for identifying the various conditions that are related to

SIB and other problem behavior prior to intervention were not described until years later (Hanley et al., 2003). Nonetheless, several studies included systematic empirical investigations of environmental influences on problem behavior (Hanley et al., 2003).

Lovaas, Freitag, Gold, and Kassoral (1965) demonstrated the effects of social-positive reinforcement (attention) on the SIB of a child who had been diagnosed with autism and mental retardation. Related studies displayed effects of attention on problem behaviors that occurred commonly in classrooms, such as aggression (Pinkston, Reese, LeBlanc, & Baer, 1973) and disruption (Thomas, Becker, & Armstrong, 1968). Sailor, Guess, Rutherford, and Baer (1968) demonstrated that problem behavior could also be maintained by negative reinforcement (escape from demands). Carr, Newsom, and Binkoff showed that aggression (1980) and SIB (1976) were correlated with the presentation and removal of demands. Similarly, Weeks and Gaylord-Ross (1981) showed that SIB was positively correlated with the difficulty of tasks. These studies not only demonstrated the effects of specific contingencies on problem behavior, they illustrated the value of identifying the conditions under which problem behavior may occur (Hanley et al., 2003). Further, these studies laid the groundwork for a comprehensive functional analysis methodology. As noted in Baer, Wolf, and Risley (1968), if one could determine the aspects of a procedure that led to problem behavior, then one could alter that procedure, so as to reduce problem behavior.

The basic methodological features of a functional analysis of problem behavior consist of direct observation and measurement of problem behavior under test and control conditions in which some variable in the environment is altered (Hanley et al., 2003). Prior to the use of functional analysis, problem behavior was typically treated by

enforcing powerful and sometimes arbitrary contingences of reinforcement or punishment over often unknown sources of reinforcement for problem behavior (Hanley et al., 2003). Researchers suggest that treatment of problem behavior cannot be expected to produce consistent positive results without first determining what events are currently maintaining the behavior (Iwata, Dorsey, Slifer, Bauman, & Richman, 1982/1994). Iwata et al. (1982/1994) understood the need to identify function of severe problem behavior such as self-injury and consequently conducted the first comprehensive analysis of the determinants of problem behavior.

Iwata et al. (1982/1994) described a functional analysis methodology to identify variables that controlled self-injurious behavior in nine children with developmental disabilities. Eight of the nine participants in this study were exposed to a series of four conditions in multielement designs with 15 min of exposure in each condition. The four conditions were (a) social disapproval, (b) academic demand, (c) alone, and (d) unstructured play. Through direct observation, an observer recorded the percentage of 10 s intervals with self injury. In the social disapproval condition, adults made statements of disapproval contingent on the presence of self-injury. This condition tested for social-positive reinforcement. The academic demand condition consisted of the adult presenting the child with task demands and when self-injury occurred, demands were withdrawn. This condition tested for social-negative reinforcement. The alone condition consisted of the child being alone in a therapy room without access to toys or any other materials that could serve as a source of stimulation. This condition tested for automatic sources of reinforcement. Unstructured play served as the control condition, where the child was in the room with an adult delivering attention and toys were available to play with

contingent upon no self-injury. Results of this study showed a great deal of between and within-subject variability. One child had a high rate of self-injury in the social disapproval condition which suggested that SIB was maintained by positive reinforcement in the form of attention. Two children showed high rates of self-injury when presented with academic tasks (demands), which suggested that SIB was maintained by negative reinforcement in the form of escape. Four children displayed high rates in the alone condition which indicated that problem behavior was maintained by automatic reinforcement. Three of the subjects showed undifferentiated patterns. As noted by Sigafoos and Saggers (1995), regardless of the undifferentiated patterns with three participants, Iwata and others' (1982/1994) study, demonstrated an effective technology for identifying the variables that control self injury in some children with developmental disabilities. In that, control techniques acquired from experimental analysis of behavior were applied to the assessment of problem behavior (Hanley et al., 2003). These findings have important implications for treatment and have led to the development of more precise reinforcement-based interventions and decreased use of punishment (Hanley et al., 2003).

The methodology Iwata et al. (1982/1994) used has been replicated successfully to identify variables that control other problem behaviors (Hanley et al., 2003). Iwata et al. (1994) conducted an experimental-epidemiological analysis regarding the function of SIB by compiling data on 152 subjects over an 11 year period of time. Participants were exposed to a series of conditions in which the effects of antecedent and consequent events on SIB were examined by way of multielement, reversal or combined designs. Differential or uniformly high responding was observed in 95.4% of the cases. Their

results supported three major conclusions: (a) experimental approaches to behavioral assessment (such as functional analysis) are highly effective methods for identifying contingencies that maintain problem behavior; (b) from an epidemiological perspective, SIB appears to be a learned behavior; and (c) knowledge about the function of behavior can and should drive the course of treatment. Hanley and others' 2003 review reported that although the majority of functional analysis studies have examined some form of SIB, aggression, or disruption, the methodology has been extended to several other problem behaviors including bizarre vocalizations, vocal tics, stereotypy, breath holding, mouthing, pica, hair pulling, non-compliance, tantrums, drug ingestion, property destruction and elopement.

Although researchers have repeatedly shown that functional analysis is a powerful assessment tool for practitioners to use to identify function of problem behavior and creating function-based treatments, concerns have been raised about the feasibility of conducting such procedures in school settings. Time constraints as well as the level of training and clinical expertise required to insure procedural integrity are among the arguments of feasibility of FAs being conducted in schools (Hanley et al., 2003). Federal law mandates that students engaging in challenging behaviors have supports put in place to keep them in their current placement and to enable them to make sufficient academic progress (No Child Left Behind Act of 2001). The Individuals with Disabilities Education Act (IDEA) (2004) mandates the use of Functional Behavioral Assessment (FBA) and behavior intervention plans (BIP) to address the challenging or severe problem behavior of some students present in school settings, if there problem behavior puts their educational placement at risk.

Shumate and Wills (2010) noted that, IDEA does not specify exactly what represents a valid FBA; therefore there is currently no single protocol for schools to follow. The lack of protocol has led to confusion among school practitioners about what actually constitutes a FBA and what the differences are between it and an experimental functional analysis (Gresham, Watson, & Skinner, 2001; Kates-McElrath, Agnew, Axelrod, & Bloh, 2007; Shumate & Wills, 2010). Often, the terms functional behavioral assessment and functional analysis are used synonymously (Cone, 1997; Kates-McElrath et al., 2007). However, it should be clarified that the two procedures describe different activities (Solnick & Ardoin, 2010). The term functional behavioral assessment is a general term that describes the process of collecting environmental information to develop a hypothesis about the occurrence of problem behavior (Solnick & Ardoin, 2010). Functional analysis, as described earlier, is the process of systematically manipulating environmental events to test behavioral hypothesis (Cone, 1997) and can be part of an FBA. A typical FBA consists of a range of direct and indirect procedures (e.g., interviews, questionnaires, descriptive analyses, direct behavioral observations, experimental functional analyses) that can be used to identify potential antecedents and consequences associated with the occurrence of problem behavior (Gresham et al., 2001).

Blood and Neel (2007) examined the utilization of assessments on developing behavior intervention plans (BIP's) and their use in designing actual implementation for students (elementary through high school age) whom received instruction in a self-contained special education classroom designed for students with Emotional Behavioral Disorder and other behavioral challenges. Results from that study showed that the majority of students did not have a functional behavior assessment (FBA) and those that

were written, lacked critical components. Further, there was no evidence of an actual functional analysis of problem behavior from the FBAs that were written. In general, the behavior intervention plans in Blood and Neel's 2007 study failed to make connections between behavior and function as well as the identification of replacement behaviors to achieve the function. Van Acker, Boreson, Gable, and Potterton (2005), reported that the majority of FBAs conducted by school personnel have serious flaws and are likely to result in inadequate behavior plans.

Descriptive analyses may be included as part of the FBA process in schools. A descriptive analysis consists of observations of the target behavior as well as record of the antecedent and consequent events surrounding the behavior as they occur naturally in a subjects environment (Sasso et al., 1992). Camp, Iwata, Hammond and Bloom (2009) noted that descriptive analyses are often used to make inferences about the contingencies that maintain behavior and to design intervention procedures. As displayed by Sasso et al. (1992), descriptive analyses have in some cases have yielded similar results as experimental analyses and therein, interventions based on the results of the descriptive analysis data were effective in reducing problem behavior. However, results of Camp and others'(2009) study were consistent with those of previous research (Lerman & Iwata, 1993, Mace & Lalli, 1991; St. Peter et al., 2005; Thompson & Iwata, 2007) in which, the outcomes derived from descriptive analyses of problem behavior generally did not match the outcomes derived from functional analyses. If descriptive analyses are used in school settings in place of functional analyses, it may account for some of the inadequacies found in behavior plans, due to the fact that descriptive analyses have been

shown to not always identify the source of reinforcement for problem behavior as noted by Camp et al. (2009).

Oliver (1991) suggested that because Iwata and others' (1982/1994) methodology requires a controlled environment, it may be difficult to implement in some applied settings, thus compromising ecological validity. These practical concerns raise the question, of whether functional analyses can be conducted under naturalistic conditions (Bloom, Iwata, Fritz, Roscoe, & Carreau (2011). Consequently, variations on the functional analysis methodology described by Iwata et al. (1982/1994) have been developed for use in more practical settings (Sigafoos & Saggers, 1995).

Sigafoos and Saggers (1995) described a discrete-trial approach for the functional analysis of aggressive behavior in two boys ages 10 and 12 with autism. In this study, 20 discrete trials were conducted under each of three conditions (attention, task and tangible), over a 5-day period. The trials were conducted by a teacher and distributed throughout the school day to occur within the existing classroom routine. The tangible trials occurred during snack time to assess a possible tangible function. Similarly, task trials occurred during academic work time to assess a possible escape function. Finally, attention trials were conducted during times when the teacher was socially interacting with the children in one-on-one situations. All trials consisted of two 60-s segments. The teacher initiated attention trials by sitting next to the child and commenting something like "I'll be right with you" and then turning away from the child, engaging in some kind of "work" and ignoring the child for up to 60 s. If aggression occurred, the teacher turned to the child and gave attention (e.g., "Please don't do that."). The second part of the trial then began, and for 60 s, the teacher continued to provide the child with

undivided attention by looking and speaking to the child in a conversational manner. Researchers recorded presence or absence of aggression in each part of the attention trial. Sigafoos and Saggers reasoned that if social-positive reinforcement (attention) was maintaining the child's aggression, it would be probable for it to occur when the child was being ignored (Part 1) as opposed to when the child had the teacher's undivided attention (Part 2). Part one of the tangible trial consisted of the teacher sitting next to the student and placing portions of a preferred food or beverage in clear view, but out of reach for the child, with the teacher commenting, "You can have this in a minute" (p. 291). At the end of the 60 s, the teacher gave the child access to the item for the next 60 s. If aggression occurred during the first 60 s, the teacher gave the child the preferred item and he was allowed continued access for the next 60 s. The authors reasoned that if a motivation for aggression was positive reinforcement in the form of access to a tangible item, then it would be probable for aggression to occur when the tangible item was being withheld (Part 1) as opposed to when the student had uninterrupted access to the preferred tangible (Part 2). Task trials began with the teacher seated next to the student with task-related materials placed on the table in front of the child. The first 60 s of these trials, the teacher verbally prompted the student to participate in the activity every 10 s if the child was not engaged in the activity. Physical guidance was used every 10 s to prompt participation if the child was not engaged in the task. If aggression occurred at any time during the first 60 s, the teacher stopped the task and removed the materials but remained close to the child to observe whether or not aggression occurred during the next 60 s. The authors hypothesized that if aggression was maintained by an escape function, then problem behavior would most likely occur during the first 60 s when demands were

made and little behavior was expected to occur during the second 60 s when no demands were made. Results from this study showed a clear pattern for each child's aggression. One participant showed the greatest amount of responding in the first min of attention trials, whereas the other participant showed the most responding in the first min of tangible trials. These results suggest that the participant's aggressive behavior was maintained by attention and access to preferred tangibles, respectively. The results of this study demonstrate a practical technique for conducting a functional analysis of problem behavior in a classroom setting.

The discrete-trial approach described by Sigafoos and Saggers (1995) suggested advantages over the traditional functional analysis described by Iwata et al. (1982/1994). First, the discrete-trial approach appeared to require minimal time and labor, although Sigafoos and Saggers did not report how much time it took to conduct 20 trials of each trial type. Second, the brief nature of the assessment was seen as an advantage as opposed to a functional analysis where children repeatedly are exposed to contingencies that may inadvertently strengthen behavior. Third, the trials were easy to incorporate into the classroom routine, contributing to the increased ecological validity of the assessments.

This study does have limitations in that it was only conducted with two children and one problem behavior (aggression). Therefore, research could be furthered by conducting a similar study with several subjects who display varied problem behaviors. Bloom et al. (2011) noted that Sigafoos and Saggers' (1995) study did not compare results obtained from the trial-based assessment with those from a more complete functional analysis. The procedures described by Sigafoos and Saggers warranted further

examination because of their potential to expand functional analysis approaches to classroom settings, thus allowing teachers and staff to conduct them under more naturalistic conditions (Bloom et al., 2011).

Bloom et al. (2011) evaluated a trial-based approach to conduct functional analyses in classroom settings and compared results with those obtained from a more typical session-based analysis. Ten students were referred for problem behavior and ranged in age from 6 to 18 years. Trial-based functional analyses were conducted in the student's classroom, with trials interspersed throughout the day among classroom activities, across 4-6 days with a total of 20 trials per condition. The standard functional analyses were conducted in a session room two to five times per day, over 3 to 7 days. The trial-based functional analysis was conducted prior to the standard functional analysis. The trial-based functional analysis consisted of 2-min segments, during which the observer recorded the occurrence or nonoccurrence of problem behavior. Standard analysis sessions were 10-min in length and an observer recorded the frequency of problem behavior. The trial-based functional analysis trials were conducted by graduate students rather than teachers to ensure high procedural consistency. Similar to the Sigafoos and Saggers (1995) study, trials were run during naturally occurring opportunities (e.g., tangible and attention trials conducted during free-play periods, demand trials conducted during instructional periods) (Bloom et al., 2011). All of the participants were exposed to attention and demand trials, but only those who were suspected to have a tangible function were exposed to a tangible condition. Participants that exhibited aggression were not exposed to ignore trials because aggression requires

the presence of another person; therefore, aggression was unlikely to be maintained by automatic reinforcement.

The following changes were made to Sigafoos and Saggers (1995) discrete-trial approach. The order of the test and control segments was reversed in Bloom and colleagues (2011) study to avoid carryover from the test segment to the control segment. Additionally, each trial was divided into three 2-min segments, rather than two 1-min segments. During the first segment (control) the establishing operation (EO) was absent and problem behavior produced no consequences. The second segment (test) the EO was present and problem behavior produced a specific consequence. A third segment (control) was a replication of the first segment. However, the results of the third segment were not reported by Bloom et al., because they decided that the control:test sequence was superior to the test:control sequence. Similar to the Sigafoos and Saggers study, the occurrence of problem behavior during any segment, terminated that segment (with the exception of ignore trials) (Bloom et al., 2011). The third modification Bloom et al. made to Sigafoos and Saggers trial-based procedures, included the addition of ignore trials as a test for behaviors maintained by automatic reinforcement. The attention, tangible and demand conditions were run similar to the conditions outlined by Sigafoos and Saggers (1995) with the previously mentioned modifications (e.g., control, test, control). Ignore trials consisted of three consecutive 2-min test segments, where the subject was seated alone, without access to leisure items or task materials and problem behavior did not provide consequences or terminate that segment of the trial.

In the standard functional analysis, subjects were exposed to a series of conditions based upon the procedures described by Iwata et al. (1982/1994). Sessions in the

standard functional analysis were continued until differentially high response rates were observed in one or more test conditions as compared to the control condition. Consensus was reached on the function of behavior in the standard functional analysis as well as the function of behavior in the trial-based functional analysis. Results of the trial-based functional analysis were compared with the standard functional analysis results. Bloom et al. (2011) reported that both assessments showed correspondence in six of the 10 cases and partial correspondence in a seventh case. Results of the standard functional analysis suggested some reasons for the cases of noncorrespondence, which was verified through portions of the trial-based functional analysis being modified and repeated. The implementation by the teacher a differential reinforcement of other behavior contingency for the absence of problem behavior in the classroom was suspected to affect the noncorrespondence with one participant. When additional trials were conducted with when the teacher was absent, problem behavior occurred in 100% of the test and control segments.

The authors suggested that these results indicate that a "trial-based format may be a viable assessment method when resources required to conduct the standard analysis are unavailable" (Bloom et al., 2011, p. 29). As exhibited in Bloom and others' (2011) study, the varied situations found in classrooms provide a number of opportunities to embed trials throughout the day. Further, trials can be conducted briefly, therefore minimizing disruptions to classroom routines. Bloom et al. did not display differences in time between the trial-based functional analysis and the standard functional analysis. However, in a similar study La Rue et al. (2010) did not determine a set length of trials prior to the trial-based functional analyses. La Rue et al. also compared the outcomes of

trial-based and standard FAs but allowed both to continue until clear patterns of responding were observed in each. Time was saved when comparing number of session minutes averaged in the functional analyses to the number of minutes averaged in the trial-based functional analyses.

According to Thomason-Sassi, Iwata, Neidert and Roscoe (2011), problem behavior is traditionally measured in response repetition. Thomason-Sassi and others' (2011) study examined response latency as an index of response strength during FA's, by conducting three experiments. Experiment 1 compared response rate and latency to the first response under acquisition and maintenance conditions. Experiment 2 compared data from existing functional analyses when graphed as rate versus latency. Experiment 3 compared results from pairs of independent functional analyses. Results showed that latency was a useful measure of responding when repeated occurrences of problem behavior are unacceptable or impractical to arrange. The trial-based FA may have had similar exposure minimization features as the Thomason-Sassi et al. (2011) study, because only one instance of behavior has to occur per trial segment. Both latency and trial-based functional analyses end segments or sessions (respectively) when problem behavior occurs. Therefore, the brief nature of the trial-based functional analysis procedure may be advantageous.

Although Bloom et al. (2011) worked with children and youth who ranged in age from 6 to 18, extensions of trial-based functional analyses with older participants would also be beneficial. Problem behavior left untreated may increase and/or become more severe as students mature from children to adults and become more physically mature children, who display severe problem behavior such as aggression and SIB and become

stronger and more astute as they age, may be more likely to cause serious physical harm to themselves and/or others.

Although the trial-based FA has shown promise as a viable, emerging technology, it is necessary for future research to examine the conditions under which school personnel can replicate trial-based procedures in the classroom. Such research could demonstrate the viability of trial-based functional analyses in educational settings. Correspondence of trial-based and standard functional analysis results is also needed to demonstrate an effective assessment method for school personnel to identify the function of problem behavior with high-school age students. It's unlikely that schools have the resources to conduct standard functional analyses due to level of expertise, length of time and additional personnel required to complete a standard functional analysis. A functional analysis methodology that allowed school personnel to conduct assessments in the classroom, using the resources in a classroom (classroom staff, materials, etc.) could be very advantageous for practitioners who lack the resources needed to conduct standard functional analyses.

Bloom et al. (2011) noted that the trial-based functional analysis may require the presence of someone who is able to identify appropriate conditions to initiate trials as well as to determine when trials have been compromised. It may be difficult for typical school personnel who do not have background in applied behavior analysis, to correctly make procedural decisions in the trial-based analyses. Alternatively, school personnel may be more likely to identify the contexts and activities where trials should be conducted because they have more experience witnessing the contexts in which problem behavior is usually displayed by students. This study investigated these concerns by

having school personnel run the trial-based functional analyses in an effort to demonstrate whether or not they could conduct trial-based functional analyses with adequate procedural integrity.

PURPOSE STATEMENT AND RESEARCH QUESTIONS

The purpose of this study was to employ an evaluation similar to that of Bloom et al. (2011) (i.e., comparison of results obtained from a trial-based functional analysis with those obtained from a typical session-based functional analysis) with high school age students as participants and school personnel conducting the trial-based functional analyses, in order to determine correspondence of results between both methods and the feasibility of the trial-based functional analyses being conducted within the classroom. Research questions were as follows:

1. Do the results from a trial-based functional analysis conducted by school personnel, with high school age students who have intellectual disabilities and problem behavior, correspond to the results obtained from a typical session-based functional analysis conducted by graduate students with the same participants?
2. To what extent can school personnel of high school age students intellectual disabilities and problem behavior, conduct trial-based functional analyses in the classroom with procedural integrity?

METHODS

Participants, Setting and Experimental Sequence

Three students, ages 15-17 attending a high school in the Western U.S. participated in the study (Jeremy, Colter, and Michael). All participants were diagnosed with intellectual disabilities. Two of the participants (Jeremy and Colter) were diagnosed with Autism. Participants were referred by the principal author of this study for the assessment of problem behavior. All of the participants received special education services in a self-contained special education classroom for the majority of the school day. All of the participants lived in group home settings. Jeremy was a 16-year-old male of Asian descent who exhibited inappropriate vocalizations, aggression and property destruction. Colter was a 15-year-old male of Romanian descent who exhibited inappropriate vocalizations, aggression and property destruction. Michael was a 16-year-old male of Hispanic descent who exhibited aggression and property destruction. English was the first language of all the participants. Informed consent was obtained from each participant's legal guardian in accordance with Utah State University's (USU) Institutional Review Board (IRB) guidelines.

Trials and sessions were conducted at the high school that all the participants attended. Trial-based functional analyses were conducted in each participant's self-contained classroom. Standard functional analyses were conducted in a session room within the high school. The trial-based functional analyses were conducted prior to the standard functional analyses.

School personnel (two special education teachers and one paraprofessional) served as therapists in the trial-based functional analyses. A specific teacher or paraprofessional was assigned to each participant in the trial-based FA. It is unlikely that teachers in typical classroom settings have access to a second teacher to help them complete an assessment; therefore a single teacher or paraprofessional completed each trial-based FA. Teacher 1 ran all trials with Jeremy. Teacher 1 was a graduate student receiving specific training to become a board certified behavioral analyst and the principal author of this study. Teacher 2 ran all trials with Colter. Teacher 2 had a MS in Special Education. Paraprofessional1 ran all trials with Michael. Paraprofessional 1 completed her student teaching, graduated with a BS in Special Education and met all of the requirements to earn her teaching credential one month prior to this study beginning. A paraprofessional was selected to run the trial-based functional analysis with Michael, because Michael most commonly displayed aggression and property destruction with paraprofessionals rather than with his classroom teachers. The school personnel were trained by doctoral student BCBAs on how to administer trial-based functional analyses over a 2- to 3-day period. Training sessions lasted approximately 1-2 hours and began with a power point presentation that included an overview of the components and procedures used in each condition of the trial-based functional analysis. The doctoral student BCBAs then role-played the procedures with the school personnel. The school personnel asked questions throughout the training. The school personnel practiced recording data as well as analyzing results of the data to determine function. Criterion for training was met when the school personnel displayed mastery of administering trials in each condition as well as interpreting function based on data depicted in training

graphs. The therapists in the functional analyses sessions were trained graduate research assistants.

Response Definition

School personnel, therapists and observers recorded data on problem behavior exhibited by participants during each trial or session. Individualized operational definitions listed in Table 1 were developed for each participant's topography of problem behavior. Two functional analyses and trial-based FAs were run with Colter. One set (functional analysis and trial-based functional analysis) was conducted for aggression and property destruction. The other set was run for his inappropriate vocalizations. The trial-based functional analyses were divided into 2-min segments, during which the school personnel conducting the trial recorded the presence or absence of problem behavior as well as the duration of each trial (control and test) on the data sheet listed in Appendix A. The school personnel also recorded anecdotal data on the activity the participants were engaged in during each trial as well as the reason(s) for failed trials. School personnel recorded participant responding for the trial-based functional analyses on the summary sheet in Appendix B at the conclusion of each analysis. The standard functional analyses for Jeremy and Michael consisted of 10-min sessions. Colter's standard functional analysis for inappropriate vocalizations also consisted of 10-min sessions. However, Colter's functional analysis for aggression and property destruction consisted of 5-min sessions due to the severity of aggression and property destruction he exhibited during his functional analysis for inappropriate vocalizations. During the standard functional analyses, the observer(s) positioned himself/herself within visual proximity of the

participant and recorded the frequency of problem behavior using! Observe software on a hand held computer to obtain real-time record of events.

Table 1
Results of Trial-based (left) and Standard Functional Analysis

Responses	Definitions	Participants
Aggression	Hitting (forceful contact between the participants hand or object in hand and another person's body from a distance of 1 ft or greater), kicking (forceful contact between the participant's foot and another person's body from a distance of 1 ft or greater), head butting (forceful contact between the participant's head and another person's body), scratching (forceful contact between the participants fingernails and another person's body), biting (forceful contact between the participants teeth and skin or clothing of another person) and pulling/grabbing (forceful contact between a participant's grasped hand and another person's body).	Colter Jeremy Michael
Property Destruction	Object throwing, swiping objects from surfaces, hand-to-object contact (from a distance of 1ft or greater), and foot-to-object contact (from a distance of 1ft or greater).	Colter Jeremy Michael
Inappropriate Vocalizations (Colter)	Any vocalization above a conversational tone (i.e. yelling).	Jeremy
Inappropriate Vocalizations (Jeremy)	Any vocalization above a conversational tone, nonsensical statements, baby talk, inappropriate noises and sexual statements.	Colter

Reliability and Procedural Integrity

Reliability data was collected during at least 32.4% of all trials (M = 36.6%) and 40% of all sessions (M = 53.3%). Reliability of the observation system for the trial-based functional analysis sessions was calculated by dividing the number of trials in which both observers record either the presence or absence of target behavior in each segment by the total number of segments. Mean reliability for all trial-based data was 98.2% (range, 92.9% to 100%). Reliability for the standard functional analysis sessions was calculated

by portioning the session into 10-s intervals and comparing the number of recorded responses in each interval by dividing the smaller number by the larger number, and averaging these fractions across the total number of intervals and multiplying by 100. Mean reliability for all standard analysis data was 97% (range, 70.6% to 100%).

Procedural integrity data were collected by a board certified behavior analyst doctoral student during reliability sessions for the trial-based functional analyses to examine percentage of correct steps used by the teachers and the paraprofessional running the trials. Data was also recorded on the number of people each school personnel interacted with during each trial as well as the number of interactions that occurred during each trial. Procedural integrity data was scored on the data sheet adapted from Kunnavatana, Bloom, Samaha, and Dayton (under review) and listed in Appendix C, by dividing the number of correct steps used by the total number of correct steps possible for each condition used in the trial-based procedures.

Pre-experimental Assessments

Prior to the trial-based and standard functional analyses, an brief MSWO preference assessment identical to the procedures described by Carr, Nicolson, and Higbee (2000) was conducted to identify preferred leisure items to be used in the assessments with each participant**.** Seven leisure items, including items the participant preferred and items typically encountered during the school day were selected. Before the assessment began, the participant was allowed to interact with each of the items for 30s. All items were then presented in an array (spaced equally close to the student) on a table. The therapist asked the participant to select an item. When the participant picked

an item, they were allowed to play with it for 30s. A score of "1" was recorded by the therapist on the preference assessment data sheet (see Appendix D) next to the item selected. Next, the therapist repeated the same sequence with all of the items (minus the item selected in the previous trial) until no items were left. Each subsequent choice was scored with the next number in the sequence (2, 3, and so on). If no choice was made within 10 s, the therapist provided one addition vocal prompt (e.g., "you can pick one"). If no choice was made following the additional prompt, all items were removed and a score of "0" was recorded for unselected items. The entire assessment was repeated three times and recorded on the same data sheet (Appendix B). The therapist then calculated the number of times each item was selected out of the total number of times it was available to determine the percent selected. The items were then labeled highly or moderately preferred for purposes of the analyses. Note: Jeremy frequently brought different toys from home that were highly preferred; therefore the Teacher 1 included his toys from home in the tangible trials along with the highly preferred items from the preference assessment.

Procedures

Trial-based Functional Analysis

The trial-based functional analyses were conducted similar to the procedures as in Bloom et al. (2011). School personnel rather than graduate students as in Bloom and others' study, conducted trials throughout the day, embedded in ongoing activities. For example, attention trials were conducted during transition periods, whereas demand trials were conducted during instructional periods. Listed in Table 2 are the activities that

provided context for the trials in each condition. Trials consisted of one control segment and one test segment. Bloom et al. used a second control segment. However, a supplemental data analysis conducted by Bloom et al., suggested that the 4-min (2-min control, 2-min test) was sufficient. The control-test sequence was used because it was less likely to produce carryover of problem behavior from one segment to the next. One-to-four trials were conducted daily in each condition. The school personnel stopped after 10 completed trials (not including failed trials). On average it took school personnel 8.75 school days to complete each trial-based functional analysis. All participants were exposed to attention, demand and tangible trials. Colter was exposed to ignore trials for his trial-based FA on inappropriate vocalizations.

Table 2
Activities That Provided Context for Trial-based FAs.

Attention Trials
• Transition periods (between instructional demands) • Free time periods
Escape Trials
• Vocational fine motor tasks (lacing, sorting, etc.) • Gross motor tasks (wiping tables, folding towels, etc.) • Writing • Spelling • Math worksheets (adding and subtracting) • Typing • Tracing letters
Tangible Trials
• Free time periods
Ignore Trials
• Transition periods (between instructional demands)

Attention. The first 2-min segment was the control segment and the second 2-min segment was the test segment. The school personnel sat with the participant and gave him two moderately-preferred leisure items as determined by the preference assessment conducted. The school personnel provided continuous attention (vocal communication and occasional physical contact, when appropriate) for the entire 2-min segment. If problem behavior occurred, the segment ended and the school personnel stopped and turned away. The second segment began by the school personnel saying "I have to work." The school personnel then turned away from the participant but stayed close (arm's length) to the participant. The school personnel ignored all of the participant's requests. If the participant engaged in problem behavior, the school personnel turned and faced the participant and delivered attention (vocal and physical) for about 10-30 s and then ended the segment. If problem behavior did not occur during a segment, then that segment continued for the full 2 min.

Escape. The first 2-min segment was the control segment and the second 2-min segment was the test segment. The school personnel sat with the participant but turned away from the participant for the entire 2-min segment. The participant did not have any leisure items or materials. No demands were placed on the participant. Problem behavior ended that segment. The second segment began by the school personnel saying "it's time to work" and delivering prompts to complete academic tasks or other tasks that resulted in problem behavior in the past. The school personnel started with a vocal prompt (e.g., "Do this task"). If the participant did not comply within 5 s, the therapist delivered a model and vocal prompt (e.g., "Do the task like this"). If the participant did not comply within 5 s, the therapist physically guided the participant to complete the task.

The school personnel continued to deliver prompts for the entire 2-min segment. If problem behavior occurred, the school personnel stopped, removed the materials, turned away and said "Okay, you don't have to." Problem behavior ended that segment. If problem behavior did not occur during a segment, then that segment continued for the full 2 min. Because this was conducted for the purposes of assessment, and not teaching per se, school personnel did not provide reinforcers for correct responses.

Tangible. The first 2-min segment was the control segment and the second 2-min segment was the test segment. The school personnel sat with the participant and gave him 2 highly preferred leisure items from the preference assessment conducted. If the participant talked or interacted with the therapist, the therapist responded in kind. The school personnel commented on the leisure item or the environment at least once every 30 s but did not issue any demands or ask any questions. Problem behavior ended the segment. The second segment began by the therapist saying, "all done" or "my turn" and physically taking the leisure items away from the participant. The school personnel continued to respond to the participant if the participant talked to her. The school personnel continued to comment on the environment at least once every 30s. If the participant engaged in problem behavior the segment ended. If problem behavior did not occur during a segment, then that segment continued for the full 2 min.

Ignore. Both 2-min segments were test segments. The school personnel started the trial by moving away from the participant (1.2 m to 1.8 m if possible). The school personnel ensured that the participant had no materials. The school personnel observed whether or not the problem behavior occurred during each segment. Problem behavior did not end either segment. The second segment did not start until the first segment

ended at 2 min. The therapist did not provide any consequences for problem behavior. All problem behavior was ignored. No eye contact was provided by the therapist. This is the only type of trial that always took 4 min.

Standard Functional Analysis

Participants were exposed to a series of conditions based on those described by Iwata et al. (1982/1994) with procedures replicated similarly to that of Bloom et al. (2011), which were arranged in a multielement design (Ullman & Sulzer-Azaroff, 1975). Sessions lasted 10-min regardless of problem behavior, with the exception of 5-min sessions for Colter's functional analysis on aggression and property destruction due to the intensity of problem behavior he exhibited during his functional analysis on inappropriate vocalizations. Sessions continued until differentially high responding was observed in one or more test conditions relative to the control condition. Best practices of standard functional analysis were used with variations of session-based FAs implemented when the multielement design yielded inconclusive outcomes for two participants. Data were analyzed by comparing rates of problem behavior or percentage of intervals with problem behavior across conditions. Trained graduate research assistants served as therapists.

Attention. The therapist was seated with the participant who had access to moderately preferred leisure items. The therapist stated that he/she had "work to do" and turned away from the participant. If the participant engaged in the target behavior, the therapist issued a statement of concern and delivered brief and gentle physical contact.

Tangible. The therapist removed the leisure items from the participant at the beginning of the session. Attention (brief verbal statements) were delivered at least once every 30 s. Problem behavior resulted in 30 s access to leisure items.

Escape. The therapist was seated with the participant and initiated trials to complete academic tasks. Prompts were delivered in a three-step hierarchy (verbal, gestural, physical) with no more than 5 s between each prompt. Compliance resulted in brief praise. If the participant engaged in the target behavior, the therapist removed the work materials, issued a statement to the participant "you don't have to work" and then turn away from the participant for 30 s.

Ignore. The participant was seated alone without materials. No consequences were delivered for the occurrence of the target behavior.

Control. The participant had continuous access to a preferred leisure item. The therapist made friendly social comments at least once every 30 s. If the participant spoke to the therapist, the therapist responded in kind. No consequences were delivered for target behavior.

Data Analysis and Outcome Comparisons

Data from the trial-based functional analyses were analyzed by comparing the percentage of control and test segments in which problem behavior occurred for each condition to determine function of problem behavior. The school personnel in the study examined individual graphs of each trial-based functional analysis to interpret the data and determine function of problem behavior depicted in each graph. All school personnel

agreed unanimously on function depicted in each graph. See Table 3 for school personnel interpretations.

Table 3
School Personnel Interpretations of Trial-based Functional Analysis Data

Participant	**Function Depicted**	**School Personnel Agreement**
Colter (Inappropriate Vocalizations)	Automatic Reinforcement	100%
Colter (Aggression & Property Destruction)	Social Positive (tangible) & Social Negative (escape)	100%
Michael	Social Negative (escape)	100%
Jeremy	Social Positive (tangible) & Social Negative (escape)	100%

The same graphs were then shown separately to a team of ten board certified behavior analysts (BCBAs) to reach consensus on the function of problem behavior depicted in each graph as well as determine if there was correspondence between their conclusions and the school personnel's. The majority of the BCBAs were not familiar with the cases (some of them were in other states and had no contact with the cases) and all graphs were assigned a number and randomized when presented to the BCBAs for identification of function. Also, the trial-based FA graphs were presented to the BCBAs several weeks prior to the standard FA graphs being presented to discourage bias from the BCBAs function determinations. Thus, even when a particular BCBA had some

familiarity with the case (as was the case with one of the BCBAs), the function identification was still a blind process. BCBAs who were out of state identified the functions via email after viewing the graphs as a .pdf file. The interpretations that came from the BCBAs were used as the basis for determining function(s) depicted in each graph as well as correspondence and partial correspondence between results of the two assessments. Correspondence was defined by the participant responding in the same condition(s) in both assessments and by not responding in the same condition(s) in both assessments.

Majority of BCBA votes ruled in determining function and correspondence depicted in each graph. Determinations are displayed in Table 4.

Table 4
BCBA Agreement on Function(s) of Problem Behavior Depicted In Both The Trial-based And Standard Functional Analyses Graphs.

Student	Trial-based FA	Standard FA	Differences in Opinions
Colter (Inappropriate Voc.)	80% agreement on automatic function	100% agreement on automatic function	20% voted tangible function in trial-based FA
Colter (Aggress. & Prop. Des.)	100% agreement on attention, & tangible	100% agreement on attention, tangible & escape function	N/A
Jeremy	70% agreement on tangible function	100% agreement on escape & tangible function	30% voted tangible & escape function in trial-based FA
Michael	100% agreement on escape function	100% agreement on escape function	N/A

BCBA agreement on function depicted in both of Colter's graphs for aggression and property destruction was 100% as well as 100% agreement on function depicted in both of Michael's graphs.

BCBA agreement on function depicted in Colter's standard FA graph for inappropriate vocalizations was 100%. Agreement for Colter's trial-based FA on inappropriate was 80% agreement on an automatic function, with 20% voting a tangible function.

BCBA agreement on function depicted in Jeremy's Standard FA graph was 100%. Agreement for Jeremy's trial-based FA was 70% voting a tangible function, with 30% voting a tangible and escape function.

RESULTS

Correspondence Across Assessments

Correspondence

Data for the two cases whose results showed correspondence between the the trial-based and standard functional analyses are displayed in Figure 1. Colter displayed inappropriate vocalizations across all conditions of his trial-based and standard functional analysis. Higher amounts of responding were recorded in the tangible trials of the trial-based FA. However,responding persisted across both segments of the ignore trials which suggest an automatic function in the trial-based functional analysis. Colter's highly preferred item used in the tangible trials was an iPad with his favorite music on it. When Colter listened to music he usually liked to sing along with the songs. It is possible that Colter's singing competed with his ability to engage inappropriate vocalizations during the control segments (it is unlikely that Colter could have sung and produced inappropriate vocalizations simultaneously). If Colter would not have sung along with the songs, he may have engaged in higher amounts of responding in the tangbile trials (control). An operational definition issue may be partly to blame for the increased responding in the test segments of tangible. Colter's definition of inappppropriate vocalizations was very similar (in topography) to the types of vocalizations that he engaged in when he was singing along to music on the ipad. It is possible that listening to music and singing along to the songs in the control served as a strong establishing operation for Colter because he was already engaging in similar topographies of vocalizaitons. Once the ipad was removed in the test, the vocaliations increased in

intensity just enough to be scored as inappropriate vocalizations. Inconsistent levels of responding occurred in the attention, escape and tangible conditions of Colter's standard functional analysis with no responding in the control sessions. An extended ignore was conducted to assess if Colter's responding in ignore was due to a carryover effect from the socially mediated conditions (attention, tangible and escape) and not automatically maintained. We hypothesized that there was an automatic function. Responding persisted and increased in each successive ignore session, confirming our hypothesis. Data from both assessments suggested that Colter's inappropriate vocalizations were not maintained by social consequences and therefore, maintained by automatic reinforcement. BCBA aggreement on function of Colter's trial-based functional analysis targeting inappropriate vocalizations was 80% for the trial-based functional analysis and 100% aggreement for the standard functional analysis.

During Michael's trial-based functional analysis, aggression and property destruction occurred solely in the test segments of escape trials, suggesting social-negative reinforcement (escape). His functional analysis initially conducted in a multi-element design, showed inconsistent responding in the attention and escape conditions. As reported by Iwata and Dozier (2008), rapidly alternating conditions of the multielement design can result in discrimination failure as was the case with Michael's standard FA as dispayed in sessions 1-20. Consequently, we proceeded with his functional analysis in a pairwise design for sessions 21-30 in attempt to get discrimination. We hypothesized that responding would increase once Michael's exposure to the contingencies increased. Results from the pairwise design conducted in

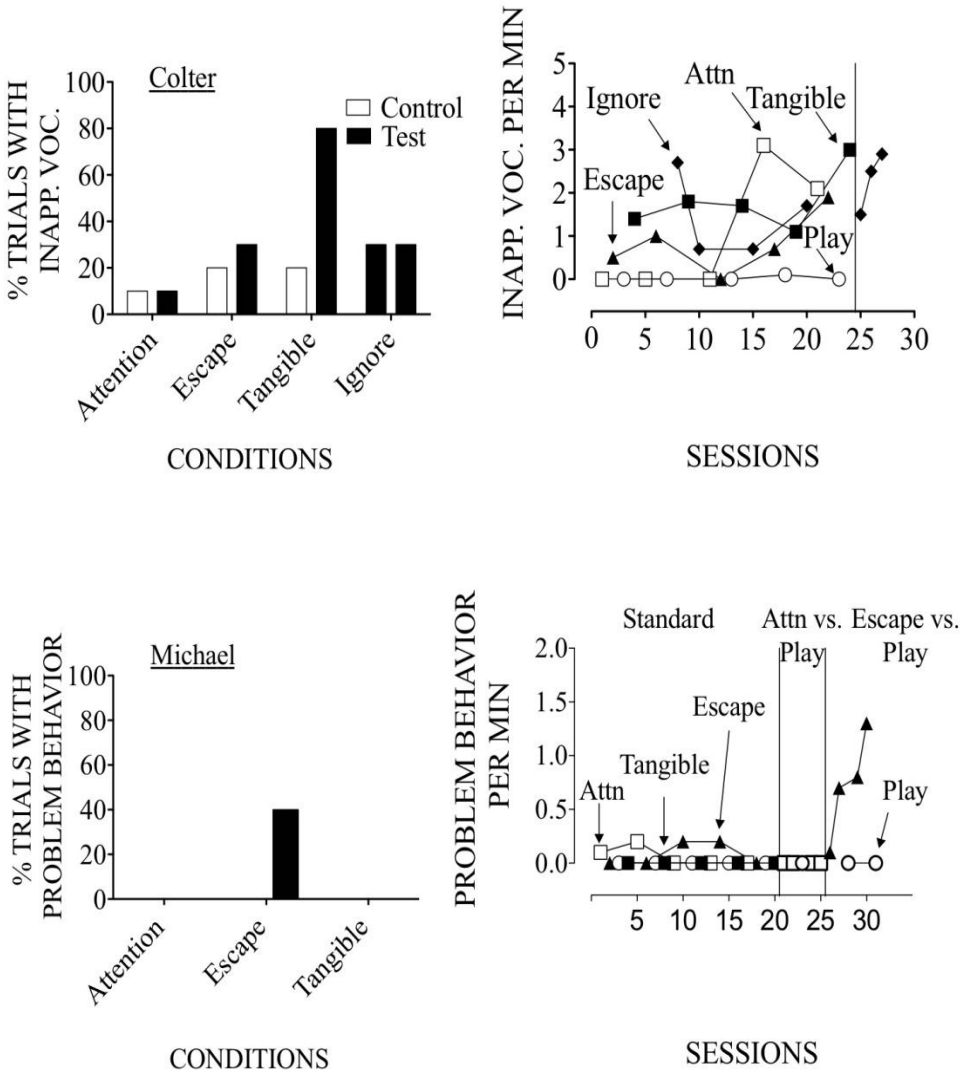


Figure 1. Results of trial-based and standard functional analysis for participants whose results showed correspondence. The top two graphs show results of the trial-based (left) and standard functional analysis (right) targeting Colter's inappropriate vocalizations, The bottom two graphs show results of the trial-based (left) and standard functional analysis (right) for Michael.

sessions 21-30 showed no responding in attention and elevated responding in each escape session with no responding in any of the control sessions, indicating Michael's aggression and property destruction were maintained by social-negative reinforcement (escape). BCBA aggreement on function was 100% for both of Michael's analyses.

Partial Correspondence

Jeremy displayed aggression, property destruction and inappropriate vocalizations most often during the test segment of tangible trials. A 50% increase in responding in the test trials relative to the control trials of his escape condition was noted. The majority of BCBAs voted the difference was not large enough because the difference in responding was one response in the control versus two responses in the test. Based on the 70% majority vote of the BCBAs, the responding in the trial-based functional analysis suggested that Jeremy's responding was maintained by social positive (tangible) reinforcement. Jeremy displayed elevated rates of responding in the tangible and escape conditions of the standard functional analysis, suggesting Jeremy's responding was maintained by social positive (tangible) and social negative (escape) reinforcement. BCBA agreement on function was 100% for Jeremy's standard functional analysis. Thus, Jeremy's trial-based and standard functional analysis showed partial correspondence using the conclusions of the majority of BCBAs, as displayed in Figure 2.

During Colter's trial-based functional analysis targeting aggression and property destruction, problem behavior occurred during his escape and tangible test segments of trials. These data suggested that Colter engaged in aggression and property destruction to

obtain social-negative reinforcement in the form of escape from demands as well as social-positive reinforcement in the form of access to tangible items.

However, in his standard functional analysis, Colter displayed aggression and property destruction in the escape, tangible and attention conditions, indicating social-negative (escape) and social-positive (tangible and attention) reinforcement and therefore giving us partial correspondence as displayed in Figure 3. BCBA agreement on function was 100% for both of Colter's analyses targeting aggression and property destruction. The lack of responding in the attention trials was hypothesized to be due to limited exposure to the contingencies that maintained Colter's problem behavior. A review of the data streams from Colter's standard FA revealed that Colter did not respond in the attention condition of the standard functional analysis until a few minutes into the session. This information supported our hypothesis that the partial correspondence may be due to limited exposure to the contingencies that maintained problem behavior during the attention trials. We then calculated the time in which Colter was responding in the

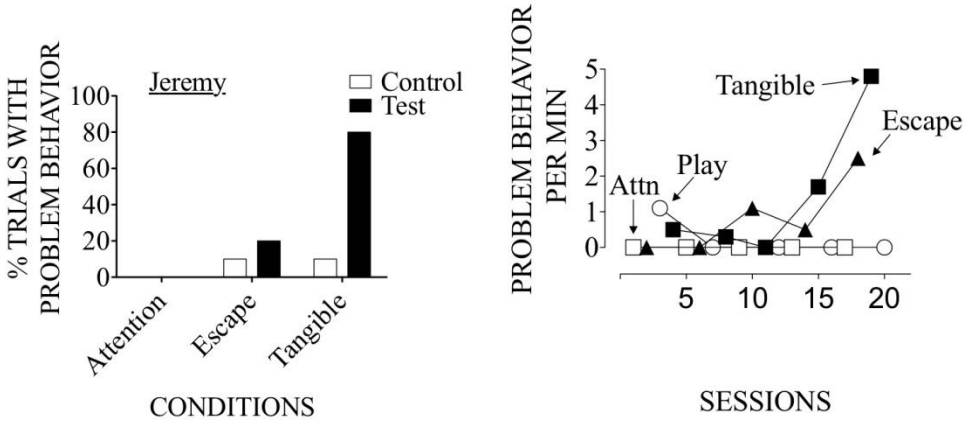


Figure 2. Results of trial-based (left) and standard (right) functional analysis for Jeremy whose results showed partial correspondence.

attention condition and determined that on average he was responding 3 minutes and 22 seconds into the sessions during the standard functional analysis. When we reconducted 10 attention trials with the increased duration of 4-min in both the control and test segments, aggression and property destruction occurred in 30% of the test segments and never in the control segments. Therefore, the lack of responding in his initial trial-based functional analysis seemed to have been a result of limited exposure to contingencies.

Procedural Integrity of School Personnel

The school personnel displayed a mean of 98.2% (range, 93%-100%) procedural integrity across all trials as displayed in Figure 4.

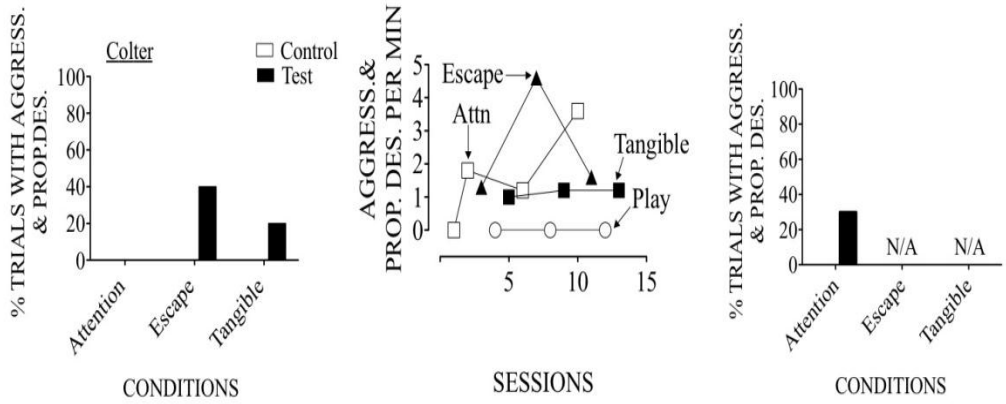


Figure 3. Results of trial-based and standard functional analysis for Colter whose results showed an initial partial correspondence followed by a modified trial-based analysis that showed correspondence (the left panel shows the results of the first trial-based functional analysis, the center panel shows the results of the standard functional analysis, and the right panel shows the results of the modified trial-based functional analysis).

School personnel failed a trial if control of some environmental variable was lost that in turn could affect the procedural integrity of the analysis.

Notably, the school personnel were very aware when a procedural error was made and consequently failed the trial if it was compromised.

Overall, school personnel failed 13 trials, totaling 18 minutes and 48 seconds of assessment time across all four trial-based functional analyses. Four of 13 trials were failed in tangible conditions, two of 13 trials were failed in escape conditions and seven of 13 trials were failed in attention conditions.

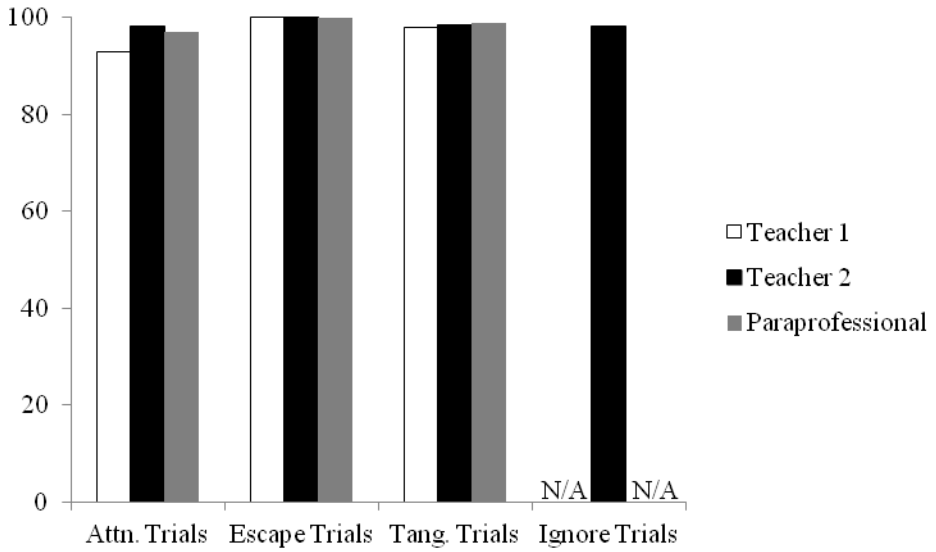


Figure 4. Procedural integrity results for the school personnel (2 teachers and 1 paraprofessional) who ran the trial-based functional analyses. The white bars represent the procedural integrity Teacher 1 displayed across each condition. The black bars represent the percentage of procedural integrity Teacher 2 displayed across each condition. The gray bars represent the percentage of procedural integrity the paraprofessional displayed across each condition.

Listed in Table 5 are the reasons recorded by school personnel for failure in each condition.

Table 5
Reasons for Trial Failure

Attention
• Another staff delivered attention to the participant during the test • Took toys away after the control • Issued demands • Started trial without giving moderately preferred items to participant
Escape
• Issued demand questions during control
Tangible
• Another staff issued a demand • Responded to the wrong problem behavior • Withheld attention during the test
Ignore
N/A- No failed trials

Figure 5 displays the average amount of people each school personnel was able to interact with as well as how many interactions they averaged during trials. Teacher 1 was able to interact with people other than the participant most during escape trials, followed by tangible trials and the least amount of interacting with others in attention trials. Teacher 2 interacted with others the most in ignore trials with very little interacting in the attention, escape and tangible trials. The paraprofessional was able to interact with others the most in attention trials, followed by escape and tangible trials. The variability in the

number of interactions across school personnel and conditions did not lead to any data-based conclusions about which conditions in the trial-based functional analysis lead to

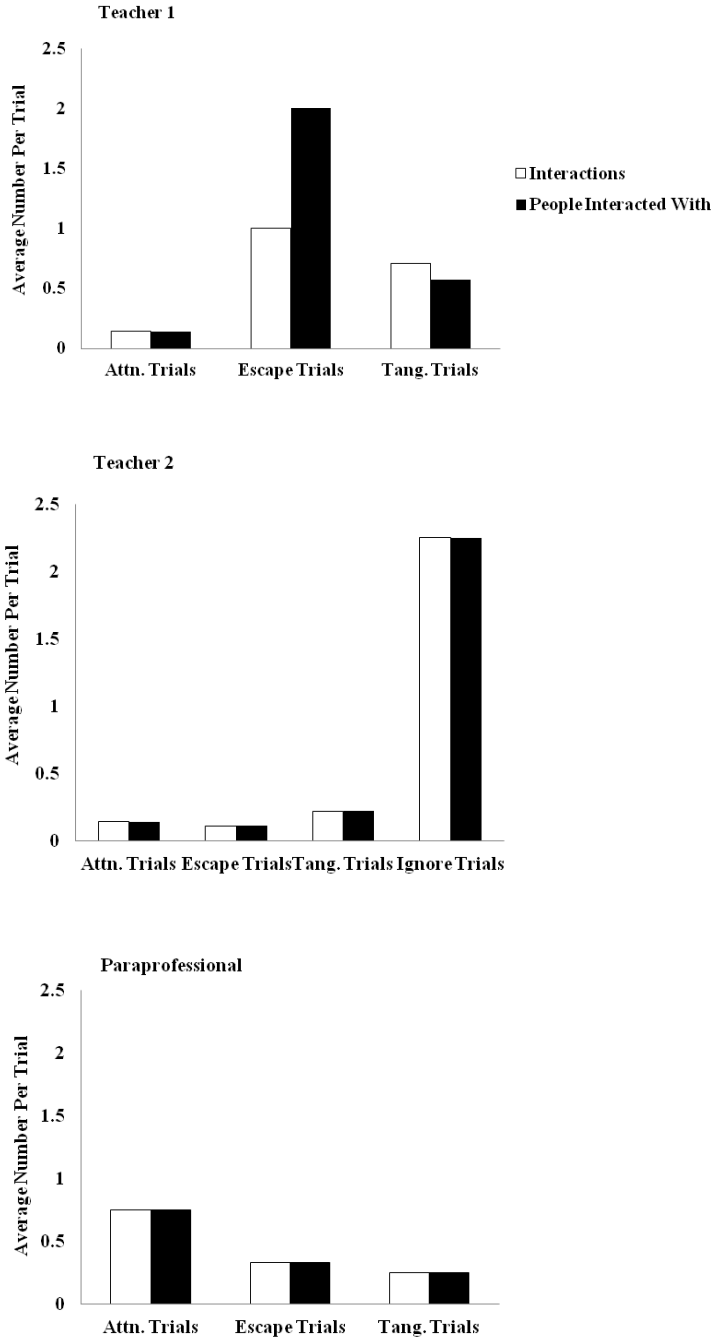


Figure 5. Average number of people interacted with as well as average number of interactions each therapist had during trials.

more interactions with people other than the participant. The school personnel reported that their interactions with other students and staff were minimal during the time in which trials were run, due to the focus needed to run the procedures with integrity.

Analysis of Assessment Duration

Data were collected on the durations of both assessment types for each participant as displayed in Table 6. Overall, standard functional analyses took an average of 228.5 minutes to complete. The trial-based functional analyses took an average of 125.7 minutes to complete. Overall, the trial-based functional analysis required 44.7% less time than the standard functional analysis.

Table 6
Number of Session Minutes Required for Standard functional Analyses and Trial-based Functional Analyses.

Participant	Analysis	Number of session minutes	Percent reduction
Jeremy	Standard FA Trial-based FA	200 min 107.5 min	46.3%
Colter (Inapp. Voc.)	Standard FA Trial-based FA	270 min 151.9 min	43.7%
Colter (Aggress. & P.D.)	Standard FA Trial-based FA	130 min 122.3 min	5.9%
Michael	Standard FA Trial-based FA	310 min 121.2 min	60.9%

DISCUSSION

This study indicates some correspondence between results of trial-based functional analyses conducted by school personnel and results of standard functional analyses conducted by graduate students with high-school aged participants who exhibit varied problem behavior. Trial-based functional analyses results matched the results of the standard functional analyses in 50% of the cases.

Both Michael and Colter's cases of correspondence required variations of session-based functional analyses to be conducted when the typical multielement design sessions yielded inconclusive outcomes. Michael's initial inconsistent responding in attention and escape conditions may have been due to discrimination failure. Although, it was reported that Michael seemed to enjoy "hanging out" with the novel graduate assistants running the FA sessions. It may have been that just being in the presence of the graduate assistants served as an abolishing operation for Michael's problem behavior. Michael's classroom teacher noted that Michael would rarely engage in problem behavior during instructional hours with people he liked (i.e., his favorite classroom teacher) and almost always engaged in problem behavior with people he seemed to not like (his least favorite paraprofessional). Regardless of what the case was with Michael, when we switched to a pair-wise design in sessions 21-30, the extended exposure to contingencies was adequate to obtain discriminated responding.

In Colter's FA targeting inappropriate vocalizations, we wanted to assess whether the responding in the ignore conditions was a result of carryover from the socially mediated conditions rather than due to automatic reinforcement. The extended ignore

condition confirmed our hypothesis that Colter's inappropriate vocalizations were automatically maintained. Although variations of the standard FA were used in both cases of correspondence, and the procedures we used were within the scope of common usage of session-based FAs (see Iwata & Dozier, 2008, for recommendations regarding the use of adaptations to the FA).

There was debate by the BCBAs in this study over the criteria for determining function in the trial-based functional analyses, which may contribute to the lack of correspondence in the first case of partial correspondence with Jeremy. The majority of BCBAs voted that Jeremy's trial-based functional analysis data depicted a tangible function. However 30% of the BCBAs voted that there was a tangible and escape function. The majority of BCBAs voted that Jeremy's functional analysis data depicted a tangible and escape function. If the majority of BCBAs had voted that there was in fact an escape function in the trial-based FA, then total correspondence would have been displayed in Jeremy's case. It's interesting that the school personnel's opinions on Jeremy's function depicted in the trial-based data were in line with the minority BCBA vote. Although, this may have been due to the fact that school personnel knew Jeremy previous to this study and may have hypothesized an escape function prior to assessment. Therefore, small differences between control and test may not have been detractors because the test responding was still a 50% increase over the control. A less conservative analysis might not consider Jeremy's case partial correspondence if data analysis was not so strict. The BCBAs who did the data analysis were not familiar with the cases and had only the graphs on which to make determinations. Mathematical criteria rather than personal opinion may have provided the context for correspondence if Jeremy's data met

the criteria for naming function. This debate warrants further investigation into the mathematical criteria necessary for the data analysis and determination of function for trial-based functional analyses. Clear criteria could be especially beneficial for practitioners using trial-based functional analyses who have limited applied behavior analysis backgrounds.

In the second case of partial correspondence, we hypothesized that the failure of correspondence in the attention conditions of the assessments may have been due to Colter's limited exposure to the contingencies during the brief trials in the trial-based functional analysis. We then decided to run additional attention trials with extended control and test segments, and responding was displayed in the test segments. Thus, displaying correspondence between assessments. This partial correspondence case is similar to one of the non-correspondence cases in Bloom and others' 2011 study where lack of exposure to contingencies in the brief trials was suggested to account for the absence of problem behavior in the trial-based FA. Bloom et al. ran additional attention trials with increased lengths, which resulted in responding during the test segments.

The two cases of partial correspondence in this study suggest that the trial-based functional analysis should not be a replacement for the standard functional analysis if those resources are available, especially considering no study has shown 100% correspondence. Rather, the trial-based FA may be a viable assessment option for school personnel who do not have the resources to conduct a standard functional analysis. As suggested by Bloom et al. (2011), the trial-based procedure may be considered a first attempt at conducting a functional analysis within a school setting, followed by more

extensive analyses for individuals with unclear results, thus reserving school resources for the most intensive cases.

Although the school personnel in this study did require training on the components, procedures and data collection of the trial-based analyses, the training was much less intensive than the training that would be required for school personnel to run standard functional analyses. It is unlikely that schools would have the resources to train personnel and run standard functional analyses on a regular basis. The school personnel in this study displayed high procedural integrity when running trials, thus suggesting that school personnel may in fact run trial-based procedures with high procedural integrity. Although some may argue that the teachers in this study were highly qualified and possibly not representative of the majority of special education teachers, it is notable that the paraprofessional, who received the same trial-based functional analysis training as the special education teachers, ran Michael's trial-based functional analysis with high procedural integrity. The paraprofessional in this study did have a bachelor's degree in special education, which would suggest that she had a basic background in applied behavior analysis, thus allowing her to understand the importance of running the procedures with integrity in each condition of the trial-based functional analysis. Future research may wish to address the level of trial-based functional analysis training necessary to train school personnel such as, paraprofessionals who do not possess any formal education in basic applied behavior analysis. It may also be advantageous to run this type of correspondence analysis with a larger sample of more naive teachers. This study was limited to three school personnel in a high school. Future research may also be needed to demonstrate correspondence between the analyses used in this study with

several school personnel teaching multiple age groups. Research covering a vast age-range of participants would demonstrate that school personnel-conducted trial-based functional analyses are an effective method at determining function of problem behavior for students of all ages.

The high school schedule consisted of multiple activities within the school day and thus allowed the school personnel in this study multiple opportunities to embed trials throughout the day. The school personnel reported that even though they felt comfortable with the training they received, they still had to plan ahead daily and determine activities and contexts to run the trials in. For example, escape trials had to be run during discrete-trial instructional demands since the demand procedures for trial-based function analyses require the use of a three-step prompt hierarchy (verbal, gestural, physical). The school personnel reported that demands such as reading and other verbal responses that cannot be physically guided through and are often times the demands in which problem behavior occur in most frequently. Also, as displayed in the results section, the school personnel reported that their interactions with other students and staff were minimal during the time in which trials were run, due to the focus needed to run the procedures with integrity. The variability among the school personnel in regards to the amount of interactions during each condition may be due to the variability of the participants themselves. Some participants might require more attending to than others based on what condition is being run. These reports by the school personnel suggest that the advantage of trial-based functional analyses being conducted in the classroom is not necessarily ease of use or little planning required on the school personnel's behalf. Rather, the major advantage is that each trial can be conducted briefly, within the school day, thus allowing students and

school personnel to remain in the classroom during assessment, which in turns minimizes disruptions to the environment, which may increase the social validity of the use of trial-based functional analyses in school settings.

It may be argued that although teachers can conduct trial-based FAs with adequate procedural integrity, it is not feasible within the classroom because several failed trials may lead to lengthy assessments. However, this study showed an overall reduction in session duration in the trial-based functional analysis in comparison to the standard functional analysis. Even with failed trials taken into account when calculating session length, the trial-based FAs in this study still saved time over the standard FAs. It is possible if more naive teachers ran the trial-based FAs, and therefore failed trials increased, the durations of trial-based analyses could be longer. Even then, length of assessment does not seem to be the major advantage of the trial-based assessment, but rather the ability of school personnel to conduct the analyses within the classroom, during the school day.

One limitation of our study was that interventions were not developed based on the outcomes of the trial-based FAs, at least during the study. However, interventions were subsequently developed using the information learned during the trial-based FAs. Regardless, future studies should include treatment evaluations in order to demonstrate that trial-based FAs lead to effective interventions for problem behavior.

Overall, the results of this study confirmed that a school personnel conducted trial-based functional analysis can correspond to the results obtained from a session-based functional analysis run by graduate research assistants, at least 50-75% of the time, depending on how trials are conducted. Further, this study suggests that school personnel

can run trial-based functional analyses with high procedural integrity in the classroom. The use of trial-based functional analyses could be very advantageous for high school teachers who deal with severe problem behavior and are in need of accessible methods of functional analyses. It is possible that if teachers were able to conduct trial-based functional analyses with procedural integrity, more effective interventions could be created and implemented with success for students whose problem behavior adversely placement and instruction. Future research might examine the ability of teachers to develop effective interventions based on results from teacher-conducted trial-based functional analyses.

REFERENCES

Bachman, J. A. (1972). Self-injurious behavior: A behavioral analysis. *Journal of Abnormal Psychology, 80,* 211-224. doi:10.1037/h0033736

Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis, 1,* 91-97. doi:10.1901/jaba.1968.1-91

Blood, E., & Neel, R. S. (2007). From FBA to implementation: A look at what is actually being delivered. *Education and Treatment of Children, 3,* 67-80. doi:10.1353/etc.2007.0021

Bloom, S. E., Iwata, B. A., Fritz, J. N., Roscoe, E. M., & Carreau, A. B. (2011). Classroom Application of a trial-based functional analysis. *Journal of Applied Behavior Analysis, 44,* 19-31. doi:10.1901/jaba.2011.44-19

Camp, E. M., Iwata, B. A., Hammond, J. L., & Bloom, S. E. (2009). Antecedent versus consequent events as predictors of problem behavior. *Journal of Applied Behavior Analysis, 42,* 469–483. doi:10.1901/jaba.2009.42-469

Carr, E. G. (1977). The motivation of self-injurious behavior: A review of some hypotheses. *Psychological Bulletin, 84,* 800-816. doi:10.1037/0033-2909.84.4.800

Carr, E. G., Newsom, C. D., & Binkoff, J. A. (1980). Escape as a factor in the aggressive behavior of two retarded children. *Journal of Applied Behavior Analysis, 13,* 101-117. doi:10.1901/jaba.1980.13-101

Carr, E. G., Newsom, C. D., & Binkoff, J. A. (1976). Stimulus control of self-destructive behavior in a psychotic child. *Journal of Abnormal Child Psychology,*

4, 139–153. doi:10.1007/BF00916518

Carr, J. E., Nicolson, A. C., & Higbee, T. S. (2000). Evaluation of a brief multiple-stimulus preference assessment in a naturalistic context. *Journal of Applied Behavior Analysis, 33,* 353-357. doi: 10.1901/jaba.1992.25-809

Cone, J. D. (1997). Issues in functional analysis in behavioral assessment. *Behaviour Research and Therapy, 35,* 259-275. doi:10.1016/S0005-7967(96)00101-5

Duker, P. C., Van Druenen, C., Jol, K., & Oud, H. (1986). Determinants of maladaptive behavior of institutionalized mentally retarded individuals. *American Journal of Mental Deficiency, 91,* 51-56.

Dunlap, G., Kern-Dunlap, L., Clarke, S., & Robbins, F. R. (1991). Functional assessment, curricular revision, and severe behavior problems. *Journal of Applied Behavior Analysis, 24,* 387-397. doi:10.1901/jaba.1991.24-387

Gresham, F. M., Watson, T. S., & Skinner, C. H. (2001). Functional behavioral assessment: Principles, procedures and future directions. *School Psychology Review, 30,* 156–172.

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. doi:10.1901/jaba.2003.36-147

Harris, P. (1993). The nature and extent of aggressive behaviour amongst people with learning difficulties (mental handicap) in a single health district. *Journal of Intellectual Disability Research, 37,* 221-242. doi:10.1111/j.1365-2788.1993.tb01281.x

Individuals with Disabilities Education Improvement Act of 2004, 20 USC § 1400 et seq. (reauthorization of the Individuals with Disabilities Education Act of 1990).

Iwata, B. A., Dorsey, M. F., Slifer, K. J., Bauman, K. E., & Richman, G. S. (1982/1994). Toward a 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). doi:10.1901/jaba.1994.27-197

Iwata, B. A, & Dozier, C. L. (2008) Clinical application of functional analysis methodology. *Behavior Analysis in Practice*, *1,* 3–9.

Iwata, B. A., Pace, G. M., Dorsey, M. F., Zarcone, J. R., Vollmer, T. R., Smith, R. G., Rodgers, T. A., Lerman, D. C., Shore, B. A., Mazaleski, J. L., Goh, H.-L., Cowdery, G. E., Kalsher, M. J., McCosh, K. C., & Willis, K. D. (1994). The functions of self-injurious behavior: An experimental-epidemiological analysis. *Journal of Applied Behavior Analysis*, *27*, 215-240. doi:10.1901/jaba.1994.27-215

Kates-McElrath, K., Agnew, M., Axelrod, S., & Bloh, C. L. (2007). Identification of behavioral function in public schools and a clarification of terms. *Behavioral Interventions, 22*, 47-56. doi:10.1002/bin.230

Kunnavatana, S. S., Bloom, S. E., Samaha, A. L., & Dayton, E. (under review). Use of a modified pyramidal training procedure to train educators to conduct trial-based functional analyses. *Journal of Applied Behavior Analysis*

LaRue, R.H., Lenard, K., Weiss, M.J., Bamond, M., Palmieri, M., Kelley, M.E., (2010) Comparison of traditional and trial-based methodologies for conducting

functional analyses. *Research in Developmental Disabilities, 31*, 480-487. doi:10.1016/j.ridd.2009.10.020

Lerman, D. C., & Iwata, B. A. (1993). Descriptive and experimental analysis of variables maintaining self-injurious behavior. *Journal of Applied Behavior Analysis, 26,* 293-319. doi:10.1901/jaba.1993.26-293

Lovaas, O. I., Freitag, G., Gold, V. J., & Kassoral, I. C. (1965). Experimental studies in childhood schizirophrenia: Analysis of self-destructive behavior. *Journal of Experimental Child Psychology, 2*, 67-84. doi:10.1016/0022-0965(65)90016-0

Mace, F. C., & Lalli, J. S. (1991). Linking descriptive and experimental analysis in the treatment of bizarre speech. *Journal of Applied Behavior Analysis, 24,* 553-562. doi:10.1901/jaba.1991.24-553

No Child Left Behind Act of 2001, Pub. L. No. 107–110, 115 Stat. 1425. (2002). http://www.ed.gov/legislation/ESEA02/

Oliver, C. (1991). The application of analogue methodology to the functional analysis of challenging behaviour. In B. Remington (Ed.), *The challenge of severe mental handicap: A behavior analytic approach* (pp. 97–118). Chichester, UK: Wiley.

Oliver, C., Murpyh, G. H., & Corbett, J. A. (1987). Self-injurious behavior in people with mental handicap: a total population study. *Journal of Intellectual Disability Research, 31*, 147-162. doi:10.1111/j.1365-2788.1987.tb01351.x

Pinkston, E. M., Reese, N. M., LeBlanc, J. M., & Baer, D. M. (1973). Independent control of a preschool child's aggression and peer interaction by contingent teacher attention. *Journal of Applied Behavior Analysis, 6,* 115-124. doi:10.1901/jaba.1973.6-115

Sailor, W., Guess, D., Rutherford, G., & Baer, D. M. (1968). Control of tantrum behavior by operant techniques during experimental verbal training. *Journal of Applied Behavior Analysis, 1*, 237-243. doi:10.1901/jaba.1968.1-237

Sasso, G. M., Reimers, T. M., Cooper, L. J., Wacker, D., Berg, W., Steege, M., Kelly, L., & Allaire, A. (1992). Use of descriptive and experimental analysis to identify the functional properties of aberrant behavior in school settings. *Journal of Applied Behavior Analysis, 25*, 809-821. doi: 10.1901/jaba.1992.25-809

Shumate, E. D., & Wills, H. P. (2010). Classroom-based functional analysis and intervention for disruptive and off-task behaviors. *Education and Treatment of Children, 33*, 23-48. doi:10.1353/etc.0.0088

Sigafoos, J., Elkins, J., Kerr, M., & Atwood, T. (1994). A survey of aggressive behavior among a population of persons with intellectual disability in Queensland. *Journal of Intellectual Disability Research, 38,* 369-38. doi:10.1111/j.1365-2788.1994.tb00417.x

Sigafoos, J., & Saggers, E. (1995). A discrete-trial approach to the functional analysis of aggressive behavior in two boys with autism. *Australia & New Zealand Journal of Developmental Disabilities, 20,* 297-297. doi:10.1080/07263869500035621

Smolev, S. R. (1971). Use of operant techniques for the modification of self-injurious behavior. *American Journal of Mental Deficiency, 76*, 295-305.

Solnick, M. D., & Ardoin, S. P. (2010). A quantitative review of functional analysis procedures in public school settings. *Education and Treatment of Children, 33*, 153-175. doi: 10.1353/etc.0.0083

St. Peter, C. C., Vollmer, T. R., Bourret, J. C., Borrero, C. S. W., Sloman, K. N., & Rapp, J. T. (2005). On the role of attention in naturally occurring matching relations. *Journal of Applied Behavior Analysis, 38*, 429–443. doi:10.1901/jaba.2005.172-04

Thomas, D. R., Becker, W. C., & Armstrong, M. (1968). Production and elimination of disruptive classroom behavior by systematically varying teacher's behavior. *Journal of Applied Behavior Analysis, 1*, 35-45. doi:10.1901/jaba.1968.1-35

Thomason-Sassi, J. S., Iwata, B. A., Neidert, P. L., & Roscoe, E. M., (2011). Response latency as an index of response strength during functional analyses of problem behavior. *Journal of Applied Behavior Analysis, 44*, 51-67. doi:10.1901/jaba.2011.44-51

Thompson, R. H., & Iwata, B. A. (2007). A comparison of outcomes from descriptive and functional analyses of problem behavior. *Journal of Applied Behavior Analysis, 40*, 333-338. doi:10.1901/jaba.2007.56-06

Ullman, J. D., & Sulzer-Azaroff, B. (1975). Multielement baseline design in educational research. In E. Ramp & G. Semb (Eds.), *Behavior analysis: Areas of research and application* (pp. 371-391). Upper Saddle River, NJ.: Prentice Hall.

Van Acker, R., Boreson, L., Gable, R & Potterton, T. (2005). Are we on the right course? Lessons learned about current FBA/BIP practices in schools. *Journal of Behavioral Education, 14*, 35-56. doi.10.1007/s10864-005-0960-5

Van Houten, R., Axelrod, S., Bailey, J. S., Favell, J. E., Foxx, R. M., Iwata, B. A., & Lovaas, O. I. (1988). The right to effective behavioral treatment. *Journal of Applied Behavior Analysis, 21*, 381-384. doi:10.1901/jaba.1988.21-381

Weeks, M., & Gaylord-Ross, R. (1981). Task difficulty and aberrant behavior in severely handicapped students. *Journal of Applied Behavior Analysis, 14*, 449-463. doi:10.1901/jaba.1981.14-4

APPENDICES

Appendix A

Trial-Based FA Data Sheet

Appendix A
Trial-Based FA Data Sheet

Trial-based FA Data Sheet

Student: Target Behavior:

Circle one: Primary / Rel

Circle One: ATTENTION TANGIBLE ESCAPE IGNORE

Date	Obs.	Activity	Control	Test	Teacher	TX I?	Time

Failed Trials

Date	Reason for failure

Appendix B

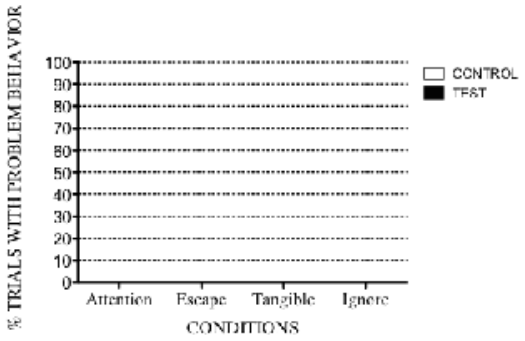
Trial-Based FA Data Summary Sheet

Appendix B
Trial-Based FA Data Summary Sheet

Trial-based FA Data Summary Sheet
Client #:
Target Behavior:

Run 10 of each type of trials. Make a note (cross out the trial *and* put a tally mark next to "failed trials" at the top of the page) if a trial has to be restarted because of error or uncontrollable event. If a trial is a "failed trial" run another trial to make sure you get 10 total trials that are completed/successful. After 10 complete trials are finished, check with research to determine if TBFA is finished. Get a reliability observer for 30% of trials. If 10 trials are run, make sure that 3 of them have a reliability observer. Members of the research team will be your reliability observers. Date – MM/DD/YY TH – Therapist's initials (your initials). Obs – Observers' initials (primary first and reliability second)* Note – you are primary. Control & Test – If nothing happens, write "-" if problem behavior occurs, make a check. TX I? – Treatment Integrity. Score yes if trial was run correctly and score no if it was not. Note, if it was not, that probably counts as a "failed trial" which is fine, but we need to know so that we can estimate how much time this takes in a school setting.

Attention: # of trials with problem behavior (control): ____/10=_____*100=_____% # of trials with problem behavior (test): ___/10=_____*100=_____ %	Ignore: # of trials with problem behavior (test 1): ____/10=_____*100=_____% # of trials with problem behavior (test 2): ___/10=_____*100=_____%
Escape: # of trials with problem behavior (control): ____/10=_____*100=_____% # of trials with problem behavior (test): ___/10=_____*100=_____%	Tangible: # of trials with problem behavior (control): ____/10=_____*100=_____% # of trials with problem behavior (test): ___/10=_____*100=_____%



Problem Behavior Function (check as many as you believe apply):
Attention _____
Escape _____
Automatic _____
Tangible _____
Unclear _____
(Only check unclear if you did not check any others)

Appendix C

Trail-Based Functional Analysis Procedural Integrity Data Sheets

Appendix C
Trial-Based Functional Analysis Procedural Integrity Data Sheets
Adapted from: Kunnavatana, Bloom, Samaha and Dayton (under review)

Attention

Therapist: _____ Student: _____ Date: _____
Trial #_____ Data Collector: _____

Segment	Step	Yes	No	N/A	FB?
Control	Therapist provided continuous attention (no more than 10s between interactions) to the student until the student engaged in target behavior or until 2 min elapsed.				
	If and when the student engaged in target behavior, therapist ended that segment.				
	Demands were not placed during the segment.				
Test	Therapist stated, "I have to work" and turned away from the student or just turned away from the student and stopped providing attention (and did not issue any demands).				
	Therapist ignored student until the student engaged in target behavior or 2 min elapsed.				
	If and when the student engaged in target behavior, therapist made statement of concern.				
	Segment was terminated after statement of concern or 2 min elapsed.				
General	Appropriate materials were provided in both control and test (moderately preferred materials).				
Data	Data collected were accurate				
	CORRECT STEPS:	/			
	% OF CORRECT STEPS:				

Tangible

Therapist: _____ Student: _____ Date: _____

Trial #_____ Data Collector: _____

Segment	Step	Yes	No	N/A	FB?
Control	Therapist allowed student to interact with toys, materials (or other preferred items) for the entire segment and no demands were placed.				
	If and when the student engaged in target behavior or 2 min elapsed, therapist removed materials and ended that segment.				
Test	Materials were kept out of student's reach until student engaged in target behavior or until 2 min elapsed and no demands were placed on the student.				
	If and when the student engaged in target behavior, materials were returned to student.				
	Segment was terminated after materials were returned or 2 min elapsed.				
General	Attention was delivered at least every 30 seconds and never withheld if the student initiated conversation.				
Data	Data collected were accurate				
	CORRECT STEPS:	/			
	% OF CORRECT STEPS:				

Feedback provided to the therapist? (Give a brief description)

Escape

Therapist: _____ Student: _____ Date: _____

Trial #_____ Data Collector: _____

Segment	Step	Yes	No	N/A	FB?
Control	Therapist DID NOT deliver any demands.				
	If and when the student engaged in target behavior or 2 min elapsed, therapist ended that segment.				
Test	Therapist placed work materials (if applicable) in front of student and delivered instruction.				
	Therapist provided instruction and prompts (including model and physical, if relevant) without delays over 10 s between demands, prompts, or ongoing work.				
	If and when the student engaged in target behavior materials were removed and the student was given a break.				
	After 2 min elapsed or the target behavior occurred, the trial was ended.				
General	Preferred leisure materials were not provided during either trial segment.				
Data	Data collected were accurate.				
	CORRECT STEPS:	/			
	% OF CORRECT STEPS:				

Feedback provided to the therapist? (Give a brief description)

Ignore

Therapist: _____ Student: _____ Date: _____

Trial #_____ Data Collector: _____

Segment	Step	Yes	No	N/A	FB?
Test 1	Therapist moved away so student is seated alone without materials and did not interact with the student or deliver demands.				
	Therapist DOES NOT provide a consequence if student engages in target behavior.				
Test 2	Therapist stayed away so student is seated alone without materials and did not interact with the student or deliver demands.				
	Therapist DOES NOT provide a consequence if student engages in target behavior.				
General	Each segment lasted 2 min.				
Data	Data collected were accurate				
	CORRECT STEPS:	/			
	% OF CORRECT STEPS:				

Feedback provided to the therapist? (Give a brief description)

Appendix D

Preference-Assessment Data Sheet

Appendix D
Preference-Assessment Data Sheet

Participant #:
Target Behavior:
Date:
Time:
☐ Primary Data Collector:
☐ Reliability Data Collector:

Materials:

1. Selected ____/____=____*100=____%
2. Selected ____/____=____*100=____%
3. Selected ____/____=____*100=____%
4. Selected ____/____=____*100=____%
5. Selected ____/____=____*100=____%
6. Selected ____/____=____*100=____%
7. Selected ____/____=____*100=____%

Trials ⇒ Selections ⇘	1	2	3
1.			
2.			
3.			
4.			
5			
6.			
7.			

Use the 2 materials with the highest percentages in the tangible trials (if used):

_____ _____

Use 2 materials with moderate percentages in the attention trials.

_____ _____