

Functional Assessment with a Student with Autism in a Special Education Setting

by

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Abstract

This study uses the functional behavior assessment (FBA) process for schools suggested by Crone and Horner (2003) to develop a function based intervention for a fourth grade student with autism in a special education setting, contributing to the literature by expanding on functional analysis (FA) technology in the classroom and demonstrating a decision-making process for FBA and FA. FBA interview and direct observation were used to develop a written schedule intervention. Student engagement and compliance increased and teacher prompts decreased. FA conducted in the classroom confirmed the hypothesized functions of behavior and supported the use of the written schedule intervention. The need for future research in the use of the FBA process in schools is discussed.

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Introduction

Epidemiological studies estimate that 1 in 150 children has an Autism Spectrum Disorder (Center for Disease Control and Prevention, 2007). Over 141,000 of these individuals are students between the ages of 6 and 21 with an autism classification receiving special education services (National Center on Birth Defects and Developmental Disorders [NCBDDD], 2006). To educate these students, the Individuals with Disabilities Education Act (IDEA) of 1990 and its 1997 amendments outlined the need for education in the least restrictive environment, typically inclusion in general education classrooms (George, 1999).

In order to be successful in classroom settings, children must have an adequate repertoire of appropriate behavior such as following directions, sustained attention, and motivation to remain actively engaged at school (Williams, Johnson, & Sukhodolsky, 2005). Disruptive behaviors such as aggression and noncompliance can interrupt instruction and often prevent students with problem behaviors from being included in general education classrooms (Downing, Morrison, & Berecin-Rascon, 1996). Students with autism “frequently display the types of behavior that make inclusion challenging” (Downing et al., 1996, p. 21). Although students with autism may do well in the presence of adult supervision, they may have trouble generalizing skills to work independently (Harrower & Dunlap, 2001). This failure to generalize learning also presents difficulties for inclusion. Additionally, the social difficulties characteristic of autism require support from teachers and paraprofessionals in order for students with autism to manage the social interactions of education (National

Research Council, 2001).

Considerable research has been published on effective practices that support students with autism in general education settings (e.g. Downing et al., 1996; George, 1999; Harrower & Dunlap, 2001; Williams et al., 2005). Specifically, functional assessment has been used to develop interventions that emphasize control of stimulus-based events (both antecedent and consequential) in order to make problem behavior irrelevant, ineffective, and inefficient (Horner, Carr, Strain, Todd, & Reed, 2002).

Functional Assessments

The 1997 amendments to the IDEA require schools to conduct functional behavior assessments (FBA) when developing individualized education plans for students with disabilities (Williams et al., 2005) and the 2004 amendments maintain that requirement. A functional behavioral assessment is “the process of identifying events that reliably predict and maintain problem behaviors...to improve the effectiveness and efficiency of behavior support” (Horner, 2000, p. 99).

The first purpose of a FBA is to identify the situations in which problem behaviors do and do not occur. The second purpose is to determine potential functions that maintain a problem behavior (Bambara, Mitchell-Kvacky, & Iacobelli, 1994). The five primary outcomes of the FBA process are, according to O’Neill, Horner, Albin, Sprague, Storey, and Newton (1997): (a) a clear description of the problem behaviors, (b) identification of the situations that predict when the behavior will and will not occur, (c) identification of the consequences that maintain the problem

behaviors, (d) development of a summary statement or hypothesis, and (e) the collection of direct observation data that support the summary statement. After the assessment, the information is used to develop an intervention.

An FBA consists of both direct and indirect measures. Data from indirect measures culminates in the generation of a hypothesis regarding the function of the behavior and typically involves the following process. The first step is to conduct informant assessments or interviews with the people who interact directly with the student. This process is used to generate an idea of when and where the behavior occurs. The second step is direct observation of the student in many settings to confirm when and where the problem behavior occurs. Also note antecedents and consequences related to the occurrence of the behavior. The last step involves using the information gathered during the interview and direct observations to develop a hypothesis related to when and where the problem behavior occurs and does not occur, as well as the maintaining consequences. The final step in a FBA is the generation of data from direct measures using a functional analysis (FA). This step involves systematically adding and removing the antecedents or consequences thought to be relevant in effecting the problem behavior (Bambara et al., 1994). By presenting different variables and observing their effects on the behavior, it is possible to determine the functional relation between those variables and the behavior. The FA is used to systematically test whether your hypotheses about the situations in which problem behaviors occur and do not occur are correct (O'Neill et al., 1997). The use of a FA increases the likelihood of interventions based on

function, thus increasing the likelihood that the intervention will be successful (Horner et al., 2002).

Research on functional assessment demonstrates the benefits of using FBA techniques for intervention development (Horner, Sprague, & Flannery, 1993; Iwata, 1994; Meyer, 1999; O'Neill et al., 1997). For example, Ingram, Lewis-Palmer, and Sugai (2005) recently demonstrated that function based interventions derived from a FBA produced a greater reduction in problem behaviors than non-function based interventions. Ervin, Radford, Bertsch, Piper, Ehrhardt, and Poling (2001) in a review of the literature on school-based functional assessments found that the majority of FBA studies conducted in school settings involved participants with a disability (89%) and were elementary school aged (71.6%). Additionally, the majority of FBAs were conducted in special education classrooms (52%), with 35% of students with disabilities receiving FBA in a natural setting only. Ervin, et al. also reported that “in all but 2 of 148 intervention cases, outcome data demonstrate[d] that the intervention strategies derived from [FBA] were successful in producing behavior change in the desired direction” (p 205).

Functional Analysis

As stated above, FA is the systematic manipulation of variables to determine which variables are maintaining a particular behavior in an individual. Iwata, Dorsey, Slifer, Bauman and Richman (1982/1994) developed a model for functional analyses that involved four conditions (attention, escape, alone, and play). Day, Rea, Schussler, Larsen and Johnson (1988) later included a tangible condition in the

analysis. A FA can include any condition for which problem behavior is likely occurring (attention, escape, tangible), and a control condition (play). The alone condition is typically used to determine whether or not the variables that are maintaining the problem behavior are socially mediated.

Though a relatively new method in the field, hundreds of FAs have been used to develop behavioral interventions for a variety of topographies of problem behavior, as well as settings and duration of conditions (Hanley, Iwata, & McCord, 2003). According to the comprehensive literature review by Hanley et al. (2003), 20.9% of published FA studies have included an individual with autism, 31.4% have been conducted at school (e.g. Lalli, Browder, Mace, & Brown, 1993; Lewis & Sugai, 1996; Northup et al., 1995, 1997; Sasso, Reimers, Cooper, Wacker, Berg, Steege, et al., 1992; Umbreit, 1995a, 1995b); 34.7% included a tangible condition (e.g. LaBelle & Charlop-Christy, 2002; Moore, Mueller, Dubard, Roberts & Sterling-Turner, 2002; Mueller, Wilczynski, Moore, Fusilier & Trahan, 2001; Vollmer, Marcus, Ringdahl, & Roane, 1995; Worsdell, Iwata, Hanley, Thompson & Kahng, 2000); 11.1% were brief i.e., conducted with a 5 min session duration (e.g. Northup, Wacker, Sasso, Steege, Cigrand, Cook, et al., 1991; Wallace and Iwata, 1999); and 4.3% addressed noncompliance (e.g. Reimers, Wacker, Cooper, Sasso, Berg, & Steege, 1993; Sprague & Thomas, 1997). However, while task engagement has been targeted in many interventions, no studies have measured disengagement from an academic task as the problem behavior during the functional analysis.

As more FAs have been conducted, researchers have learned many things.

Iwata et al. (2000) developed a method of teaching untrained students to conduct functional analyses. This research demonstrated that the basic skills for conducting a FA can be quickly learned with training. Research has also looked at conducting brief FAs (Sigafoos & Sagers, 1995; Northup, et al., 1991) of shorter session duration and found similar results to FAs of longer duration. Additionally, Kahng, Iwata, Fischer, Page, Treadwell, Williams, et al. (1998) found descriptive and functional analyses to be more efficient in leading to an intervention than visual inspection and correlational analysis of scatter plot data.

According to Hanley et al. (2003), 31.4% of functional analyses in published studies were conducted in school settings. Because school settings are the environment in which children spend a majority of their time, and because analogue conditions have been criticized for not generalizing to the natural environment, FA techniques must be adapted to the classroom (Ervin, Fugua, & Begeny, 2001; Ervin, Radford, Bertsch, Piper, Ehrhardt, & Poling, 2001; Kamps, Wendland, & Culpepper, 2006; Moore, Edwards, Sterling-Turner, Riley, DuBard, & McGeorge, 2002; Mueller, Edwards, & Trahan, 2003; Mueller, Sterling-Turner, & Moore, 2005; Radford, Aldrich, & Ervin, 2000; Wright-Gallo, Higbee, Reagon, & Davey, 2006). Conducting a complete FBA including FA can be costly for a school in time and resources. In an attempt to conserve educational resources, Crone and Horner (2003) suggest decision rules for schools to determine what level of assessment is necessary to develop a function based intervention. Crone and Horner describe three levels of assessment: simple FBA, consisting of a brief teacher interview; full FBA, consisting of additional

interviews and direct observation; and functional analysis, consisting of direct manipulation of the variables that may affect behavior. According to the authors, assessment should begin with a simple FBA and the development of a hypothesis about why the behavior is occurring. If confidence, on the part of the teacher and others involved, in the accuracy of the hypothesis is high, an intervention should be developed and implemented. Only if confidence in that hypothesis is low, should a full FBA be conducted. Information from the full FBA should be used to again develop a hypothesis statement. If the confidence in the hypothesis is high, an intervention can be developed and implemented. If the confidence is low, a functional analysis must be conducted in order to develop a hypothesis and intervention. However, a need in the literature exists for applied studies that demonstrate these decision rules when developing function based interventions.

One example of the type of applied studies needed is provided by Lalli, Browder, Mace, and Brown (1993). They conducted a pair of studies on the use of descriptive and experimental analyses to develop behavioral intervention in public school settings. In the first study, they conducted a descriptive analysis of the problem behaviors of three elementary school students with severe mental retardation. The analyses included teacher interviews and direct observation within the students' special education classrooms. Functional behavioral interventions were designed based on the results of the descriptive analyses. In the second study, Lalli et al., measured the accuracy of the descriptive analyses by monitoring the results of the interventions and conducting a functional analysis for each student. The results from

both the descriptive-analysis generated interventions and the functional analyses supported the original hypotheses developed from the descriptive analyses. The authors describe their rationale for conducting an experimental analysis after implementing intervention:

By developing individual interventions based on descriptive analysis data, we were able to provide the teachers with procedures that quickly produced substantial decreases in the students' problem behaviors. In addition, our inferences regarding the hypotheses derived from the descriptive analysis were strengthened with the findings from the experimental analysis. (Lalli et al, 1993, p. 228)

In sum, FBAs are used to identify the antecedents and consequences of a behavior. The FA is part of Crone and Horner's full FBA and directly manipulates the consequences following a behavior. FBAs and FAs are used to develop function based interventions to change problem behaviors (Ingram et al., 2005). Despite increasing information on FBAs and function based interventions, continued research on the effective use of FBA technology in the classroom is needed to assist teachers and school administrators in the development of function based interventions (Ervin et al., 2001).

Function-based Interventions

Activity Schedules

Once a FBA has been completed, the next step is to develop an intervention based on the results of those assessments. One intervention option that is gaining

attention is the use of activity schedules (Bryan & Gast, 2000; Dettmer, Simpson, Myles, & Ganz, 2000; Massey & Wheeler, 2000; O'Reilly, Sigafoos, Lancioni, Edrisinha, and Andrews, 2005; MacDuff, Krantz, & McClannahan, 1993; McClannahan & Krantz, 1999; Schmit, Alper, Raschke, & Ryndak, 2000; Steed & Lutzker, 1997). Activity schedules generally consist of a list of pictures or words of activities or tasks to be completed and can be used to address many different functions of behavior. An activity schedule can be used to provide an acceptable way to gain attention at the end of each activity. Activity schedules can also be used to provide a visual cue for when the student will receive a break (escape) or access to a favorite activity (tangible).

Students with Asperger's syndrome often have poor problem-solving and organizational skills (Simpson & Myles, 1998). This can lead to many problems in the classroom, including difficulty working independently. Students with Asperger's syndrome can benefit from routines and schedules to help them better organize their environment (Simpson & Myles, 1998). Mesibov, Browder, and Kirkland (2002) note a lack of research on the use of activity schedules for work completion in school, as well as the effects of choice within a schedule.

Previous research on activity schedules primarily addressed the use of picture schedules to decrease problem behavior during transitions (Dettmer et al., 2000; Schmit et al., 2000); to decrease self-injurious behavior (O'Reilly et al. 2005); and to increase task engagement (Bryan & Gast, 2000; Massey & Wheeler, 2000; MacDuff et al., 1993; Steed & Lutzker, 1997). Steed and Lutzker (1997) reported an increase in

task completion and a decrease in prompting after the introduction of a picture schedule for an adult with vocational tasks. In addition to a reduction in self-injurious behavior, O'Reilly et al. (2005) also reported an increase in task engagement for an adolescent with autism when using a picture schedule.

The components of activity schedules have also been investigated. Lalli, Casey, Goh, and Merlino (1994) compared the effects of picture schedules to written schedules for two adults with mental retardation. They found that the written schedules resulted in more compliance and less problem behavior than the picture schedules. Additionally, though several authors discuss the benefits of using a schedule that communicates the amount of work required to the student with autism (Heflin & Simpson, 1998; Mesibov, Browder, & Kirkland, 2002; Quill, 1995), little research has used a written activity schedule intervention.

O'Reilly et al. (2005) used the results of a functional analysis to develop an activity schedule for use in the classroom to reduce self-injury and increase engagement in a student with severe autism. The functional analysis, conducted in the classroom by the researcher, consisted of four conditions: attention, no interaction, demand, and play. Each session was 5 min in length and 10-s partial interval data were collected. Engagement was defined as "being actively and appropriately involved with instructors or items" (p. 306). Within the functional analysis, the student would continue self-injury after the demand session into the following session. A schedule of demand, no interaction, play, and demand was tested in the functional analysis and self-injury decreased to zero. This schedule was implemented

in the classroom with a successful reduction in self-injury and increase in engagement. Maintenance checks at three and five months showed continued effects. The authors suggested future research should continue to develop functional analysis techniques for use in the classroom and in the development of activity schedules.

Lalli et al. (1994) examined the use of activity schedules and escape extinction to decrease aberrant behavior and increase compliance in two adults with mild mental retardation. Both participants were 18 years old, engaged in severe aggressive and disruptive behaviors, and had previous experience with picture activity schedules. The authors also “trained and tested for 16 equivalence classes, each consisting of a dictated activity name, an activity depicted in a photograph, a printed word on a flash card, and a printed word on an activity schedule” (p. 706). After conducting a functional analysis, the authors determined that both participants’ aberrant behaviors occurred most frequently during the escape condition. During intervention, participants were given a prompt to look at and follow the schedule at the beginning of each 30-min interval. The experimenter provided praise for attending to the schedule and provided information on the time limit for completion of the activity and the reward obtained if the activity was completed within the time limit. Participants were required to complete an activity even after the time limit for reinforcement had past before moving to the next activity. For both participants, the printed schedule resulted in fewer problem behavior and increased compliance from baseline and the picture activity schedule. Possible explanations for the difference in results between printed and picture schedules include the participants’ previous

history with picture schedules and that a printed schedule was more age appropriate and may have been preferred. This study used both escape extinction and an activity schedule to change behavior. The authors suggested future research should address the use of schedules without an extinction procedure.

Activity schedules can also include a choice component. There is evidence of the reinforcing effects of providing individuals with choice-making opportunities (Dyer, Dunlap, & Winterling, 1990; Fisher & Mazur, 1997; Mithaug & Mithaug, 2003; Seybert, Dunlap, & Ferro, 1996; Watanabe & Sturmey, 2003). Seybert et al. (1996) found that providing high school students with intellectual disabilities the opportunity to choose their tasks resulted in high and stable rates of task engagement. Dyer et al. (1990) found that simply providing a choice of tasks and preferred items, without conducting repeated preference assessments, resulted in a reduction of aggressive and problem behaviors in elementary school aged children with severe developmental disabilities. Similarly, Watanabe, and Sturmey (2003) found that adults with developmental and behavioral disorders demonstrated higher rates of on-task behavior when they were allowed to create their own activity schedules. A small but growing body of literature shows evidence for use of activity schedules to address specific functions of behavior.

Purpose

The current study expands on the literature by adding to the limited number of functional analysis studies conducting sessions during typical classroom activities and by targeting noncompliance (e.g., Reimers et al., 1993; Sprague & Thomas, 1997)

and disengagement during the FA conditions. This research also adds to the growing number of studies using an activity schedule to address the function of behavior and change behavior (Bryan & Gast, 2000; Dettmer et al., 2000; Lalli et al., 1994; Massey & Wheeler, 2000; O'Reilly et al., 2005; Schmit et al., 2000; Steed & Lutzker, 1997).

This study sought to answer the following research questions: (a) Would an intervention (i.e., a written activity schedule) based on the results of a functional behavior assessment (FBA) be effective in modifying the behavior of a student with autism in a special education classroom? (b) Would the results of a functional analysis in the classroom support the hypothesis generated from a preceding FBA interview? (c) How effective is the full process (Crone & Horner, 2003) in developing and implementing function based interventions in school settings?

Method

Participant

The participant was a 10-year-old boy with Asperger's Syndrome attending 4th grade. He communicated in full sentences and was reading at a 4th grade reading level. His special education teacher requested assistance for him because he required a teacher or paraprofessional to keep him on-task in order to complete his assigned work in a reasonable amount of time. The teacher also reported a history of aggressive behavior that had been decreased with the use of a "safe seat". The student's teacher wanted to address independent work skills in the student's school IEP. The student was currently enrolled in an active research project exploring the effect of secondary and tertiary supports for schools that had School-Wide Positive

Behavioral Support (Sugai & Horner, 2002) programs in place. Informed parental consent was obtained prior to the onset of the study.

Setting

The setting was in a self-contained special education classroom in an suburban Midwestern public elementary school (312 students enrolled, 60.3% economically disadvantaged, 67.9% Caucasian, 15.1% African American, 9.0% Hispanic, 2.2% Indian, 5.8% Asian). The student was placed in a self-contained special education classroom for reading, writing, and math, but attended a general education classroom with his 4th grade peers for social studies, science, art, music, physical education, computer lab, and library. Seven students in third through fifth grade, and 3 adults (a certified special education teacher and two paraprofessionals) were in the classroom throughout the course of most of the day.

The classroom included a small area separated from the rest of the classroom. If the student did not comply with the teacher instructions to work, he was subsequently sent to the classroom “safe seat” area where he was not required to work and gained access to books to read. The classroom teacher explained that aggressive behaviors had been eliminated using the “safe seat” as a cool down area. When the student did not comply with instructions to do his work, the teacher would send him to the “safe seat” to read quietly until he was ready to work. The “safe seat” was also used for the other students in the classroom for similar reasons.

Materials

Written Activity Schedule

The intervention materials consisted of a clipboard, a kitchen timer, Velcro®, and laminated strips of paper containing the academic assignment, the amount of work to be completed, the amount of time to finish, and a place to record a check mark or smiley face. The student earned access to a box full of library books checked out by the teacher with the student's favorite characters (Rugrats, Sponge Bob, Magic School Bus, etc.).

Writing Assignments

The student's writing time was chosen for intervention because of teacher reports that writing assignments resulted in more problem behaviors than other assignments. The student's writing assignments typically consisted of worksheets or journal writing. Worksheets were usually one page short answer assignments over a story the class had finished reading. For journal writing, the student was simply given a topic to write about in his spiral notebook. Completed journal entries were at least one page long.

Measures

Functional Assessment Interview

A brief functional assessment interview form with communication assessment (adapted from O'Neill et al., 1997; see Appendices A1 & A2), used to attempt to determine the possible functions of the student's noncompliance and disengagement during writing assignments, included questions on the frequency of problem behavior, events surrounding the behavior, possible functions of the behavior, and the likelihood of a person to engage in problem behavior in certain situations (e.g. "Are

the above behavior(s) more likely, less likely, or unaffected by changes in routine?”). Additionally, the communication assessment inquired as to how the student responded in situations such as requesting help, requesting preferred items, requesting a break, showing something, indicating pain or confusion, and protesting or rejecting a situation.

Dependent Variables

Engagement was defined as attending to the activity by looking at the teacher or materials (Brooks, Todd, Tofflemoyer, & Horner, 2003). Engagement was measured using whole interval recording and was scored as long as the student did not look away for more than 3 consecutive s within the interval.

Compliance was measured as a percent per opportunity – either a teacher instruction or teacher prompt opportunity. Compliance was defined as the student performing or beginning to perform the action instructed by the teacher within 3 s. Noncompliance was defined as a failure to act or begin to act according to teacher directions within 3 s (Mace & West, 1986).

Ten s interval data (Calderhead, Filter, & Albin, 2006; Holman & Baer, 1979; see Appendix D) were recorded for a maximum of 10 min, stopping early if the student finished all the assigned work (three times) or if the teacher ended the writing lesson to begin another lesson (one time).

Teacher Report

The teacher completed a brief fidelity checklist and report (see Appendix E) on the student’s use of the schedule during writing time. The teacher marked steps

completed by both the teacher and the student. The teacher also rated five items related to ease of use and student compliance on a scale of 1 to 5, 5 being the highest.

Data Collection

The researcher served as the primary observer in all phases of the study. The primary observer recorded student and teacher behaviors, while the teacher or paraprofessional conducted the regularly scheduled writing lesson at the regularly scheduled time. Observations lasted 10 min or until the assigned work was completed or the teacher changed lessons. A maximum of one observation session was conducted per day, though observations were not always conducted on consecutive days. Observation intervals were cued by a prerecorded 10-s interval tape listened to through earphones. Observations were not conducted if the primary teacher or paraprofessionals were absent or if a structured writing assignment was not scheduled that day.

Observer Training and Reliability

Reliability observers were staff working in the school as part of the research project. Reliability observers were trained to an 80% reliability criterion with the primary observer prior to baseline. Training included reading and reviewing the behavior definitions and practice in the student's classroom until 80% reliability was obtained for one session. Reliability sessions were conducted in each phase of the study. Reliability sessions were conducted by having both observers listen to the same prerecorded 10-s interval tape while observing. The observers listened through separate earphones at a distance large enough to assure independent recording.

Reliability was calculated as the number of intervals of agreement divided by the number of intervals of agreement and disagreement for teacher prompts and academic engagement. Compliance reliability was based on an item by item comparison of each prompt recorded. Agreement was scored when both observers recorded the same student response (either compliance or noncompliance) to the same teacher prompt. If two observers did not agree on the number of prompts within an observation, the teacher prompts scored by the primary researcher were used to determine compliance and noncompliance reliability.

Procedures

Interview

A brief functional assessment interview with communication assessment (see Appendices A1 & A2) was conducted to determine the problem behaviors and their probable functions. The researcher met with the teacher after school hours and completed the assessment form based on the teacher's responses.

Functional Analysis

A functional analysis (Iwata et al., 1982/1994) was conducted to determine the possible functions of the student's noncompliance and disengagement during writing assignments. The functional analysis measured the frequency of teacher prompts and attention, student compliance per opportunity, and a momentary time sample of student engagement using a 10-s interval recording datasheet (see Appendix B).

The functional analysis consisted of a multi-element design; visual inspection

of the data was used to determine the function of the behavior. The functional analysis was conducted by the researcher in the special education classroom during the regularly scheduled writing time. The special education teacher did not conduct the functional analysis due to time restrictions at the end of the school year. The functional analysis compared 4 conditions: attention, escape from demand, access to tangibles, and play. The functional analysis was conducted over 4 days with all 4 conditions run each day. Each condition was run for 5 min (Northup et al., 1991; Wallace & Iwata, 1999) with 2 min breaks separating conditions and 10-s interval data were recorded. Writing worksheets were presented in 3 conditions (i.e., attention, escape, and tangible) with the initial instruction to “Do your work.” The target behavior was disengagement, which was defined as failure to attend to the assignment for 5 consecutive s. During the escape condition, the researcher delivered an instruction (“Do your work,” “Keep working,” “Get back to work,” etc.) at the beginning of every 30-s interval. During the attention and tangible conditions, the worksheet was always present, but no additional demands were placed on the student after the initial presentation to establish a difference between escaping a demand and gaining access to either attention or a tangible. The attention and tangible conditions were also broken into 30-s intervals which reset the condition. Teacher attention and the book were delivered following the first 5 s of disengagement per 30-s interval and the book was removed at the beginning of the following 30-s interval. To further differentiate the conditions and to make changes in conditions more salient to the student, brightly colored placemats were used under the writing assignments

(Conners, Iwata, Kahng, Hanley, Worsdell, & Thompson, 2000). Each condition had a different color. Attention was yellow, escape was red, and tangible was blue. No placemat was used during the play condition.

Attention condition. After the presentation of the worksheet and the initial instruction, the researcher turned away and diverted attention from the student. If the student began to work within the first 5 s after the instruction, the researcher continued to ignore the student until he stopped working. If the student stopped working for 5 consecutive s within the 30-s interval, the researcher turned to the student and delivered conversational attention for 5 s without demands or instructions. Conversational attention consisted of statements such as “I’m sorry you feel that way.” and “I bet you know how to do it.” Conversational statements were used instead of demands or prompts and were delivered only to the first inappropriate behavior every 30 s so as to keep those rates constant with the rates of demands or prompts in the tangible and escape conditions. The researcher then ignored the student for the remainder of the 30-s interval regardless of whether the student complied. At the beginning of the next 30-s interval, the researcher responded to the student as previously described. High rates of disengagement in this condition would indicate that the function of the student’s disengagement was to gain attention.

Escape condition. After the presentation of the worksheet and the initial instruction, the researcher turned away and diverted attention from the student. If the student began to work within the first 5 s after the instruction, the researcher continued to ignore the student until the beginning of the next 30-s interval, at which

time the researcher delivered another instruction. If the student stopped working for 5 consecutive s within the 30-s interval, the researcher removed the work and ignored the student until end of the 30-s interval. At the beginning of the next 30-s interval, the researcher delivered another instruction and represented the work if it had been removed during the previous 30-s interval. High rates of disengagement in this condition would indicate that the function of the student's disengagement was to escape academic demands.

Tangible condition. Immediately prior to the start of the condition, the researcher placed a highly preferred book on the table where it was clearly visible to the student (Umbreit, 1995a). The tangible condition was conducted with the preferred book in view of the student for the entire session (LaBelle & Charlop-Christy, 2002). The same book was also used for the play condition conducted that day, but the specific book differed across days. After the presentation of the worksheet and the initial instruction, the researcher turned away and diverted attention from the student. If the student began to work within the first 5 s after the instruction, the researcher continued to ignore the student until he stopped working. If the student stopped working for 5 consecutive s within the 30-s interval, the researcher gave the student a book on a preferred topic and ignored the student until the end of the 30-s interval. At the beginning of the next 30-s interval, the researcher said "My turn," removed the book, and ignored the student until he was disengaged for 5 consecutive s. The researcher then responded as previously described. High rates of disengagement in this condition would indicate that the function of the

student's disengagement was to gain access to books.

Play condition. The researcher directed the student to the classroom break area which contained beanbags and books. The researcher sat next to the student and delivered attention at least every 30 s. No demands were placed on the student. Since this condition was structured as free time, the student had no opportunities to be disengaged from any specific activity. This condition served as the control to which the other conditions were compared.

Functional Analysis Procedure Fidelity

A fidelity checklist (see Appendix C) was completed by the observers on the researcher's ability to conduct the FA. The observers rated the researcher on six to eight items per FA condition and two items regarding the entire session. The fidelity checklist consisted of items such as "Did the researcher place an assignment in front of the student?" "Did the researcher deliver attention/book/remove task upon the emission of the target behavior?" and "Were the conditions run in the appropriate order?" Observers answered the questions "yes" only if the researcher followed that procedure 100% of the time. A "no" was recorded if the researcher only performed that behavior less than 100% of the time. Fidelity checklists were completed immediately after the final condition of the session.

Experimental Conditions

This study used a multi-element design (Bailey & Burch, 2002; Cooper, Heron, & Heward, 1987) during the functional analysis. The multi-element design allowed for the comparison of attention, escape, tangible, and play conditions in rapid

alternation. This study used an A1,A2,B,B design with the FA conducted between the first and second Bs. This design allowed for comparison between baseline conditions (A1 & A2) and the intervention (activity schedule use) condition (B).

Baseline. Direct observations were conducted for the first 10 min of the writing lesson. Typical writing lessons were conducted by the special education teacher and included the student usually sitting one on one with the teacher or paraprofessional and the teacher or paraprofessional delivering multiple prompts to the student to remain on task or move on to next word, sentence, or line.

Modified baseline. The teacher was instructed to give the student the initial writing lesson instructions and then to avoid further instructions or prompts for the remainder of the 10-min observation period. The goal of the modified baseline was to determine the student's level of engagement if he was not given frequent prompts by the teacher to continue working.

Intervention. The researcher and teacher hypothesized that the student's target behaviors were sensitive to escape, tangible, and attention reinforcement. A written activity schedule was used to provide a visual representation of scheduled breaks to address escape, to provide an appropriate method of gaining access to tangible reinforcement, and to provide a cue as to when to seek teacher attention and to signal the teacher to attend to appropriate work behavior. Completion of predetermined number of items was rewarded with access to books. Initially, the activity schedule was read aloud to the student. The teacher explained that "This is the work you have to do before you get what's in your box." The teacher then showed the student the

box of books available. The box and the books inside it were only available for completion of work. The student was allowed to choose whether to work for a certain amount of time or to write a certain number of sentences. Teachers were instructed to limit prompts to initial work instructions. Infrequently, teacher prompts took the form of reminders of how much work was necessary to gain access to the box when the student was disengaged. The teacher answered all questions related to the assignment (understanding the directions, spelling words, etc). When the student completed the assigned amount of work, the student put a smiley face or check mark next to the assignment on the clipboard. He then told the teacher he was done and the teacher delivered access to the box for a brief amount of time depending on the amount of work agreed upon. For example, 5 min of work or 2 sentences generally earned 5 min of access to the box. Ten min of work or 4 sentences generally earned 10 min of access to the box.

If the student did not complete the work during the regularly scheduled time, he did not gain access to the box until the work was completed, whether it was later that day or the next day. After the time with access to the box was over, the teacher collected the materials and returned them to the box. The student usually had the opportunity and time to complete more writing work to earn more time in the box before moving on to a new academic lesson.

Removal of intervention and FA. Observational data combined with teacher reports showed variable levels of student engagement during intervention. Teacher verbal reports indicated a lack of confidence in the intervention correctly addressing

the student's behavior. In order to either support the intervention or modify it, a functional analysis was scheduled, as Crone and Horner (2003) suggest. The FA conditions were run during writing assignments and therefore the intervention could not be simultaneously conducted.

Intervention reinstated. After the functional analysis, the intervention was reinstated as previously described. Data were collected during the regular classroom writing time. The schedule was used as during intervention and teachers were instructed to keep prompts at low levels.

Results

Functional Analysis

Figures 1 and 2 summarize the results from the functional analysis. In Figure 1, along the x-axis are sessions and along the y-axis are the percentage of 10-s intervals with the occurrence of the target problem behavior (i.e. disengagement). In Figure 2, along the x-axis are sessions and along the y-axis are the percentage of 30-s intervals with the occurrence of the target problem behavior (noncompliance). Visual inspection of the graphs revealed the two behaviors were part of the same response class due to the similarity of responding during FA conditions. Each condition is represented by a symbol: open diamond for attention, closed diamond for escape, open square for tangible, and closed square for play. These data illustrate an elevated level of target behaviors in the tangible and escape conditions compared to the play condition, but a variable level for the attention condition.

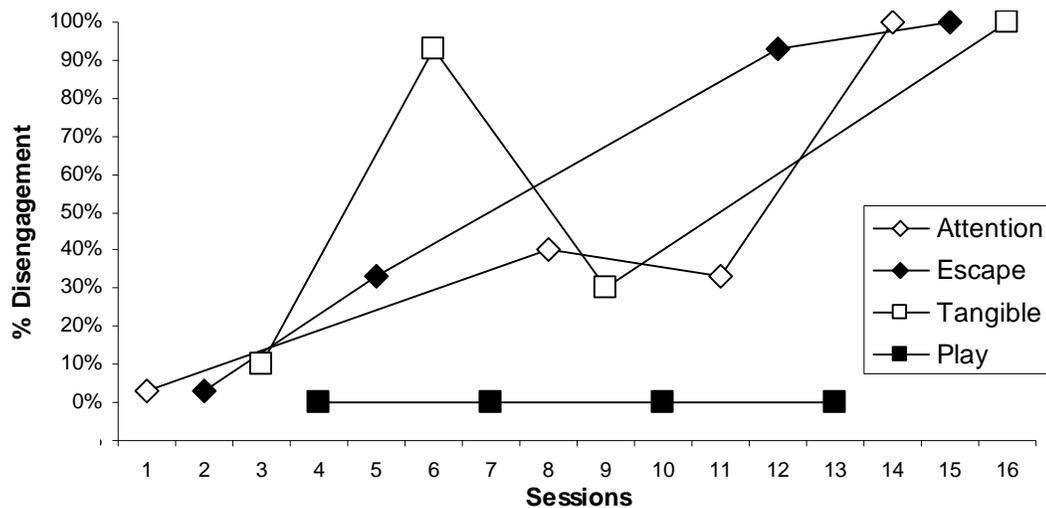


FIGURE 1

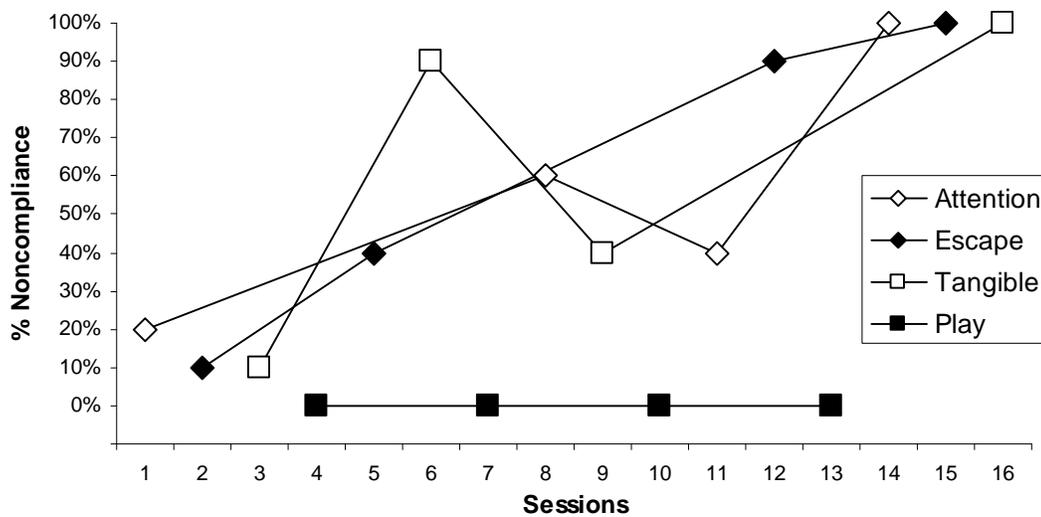


FIGURE 2

The mean percentage of 10-s intervals in which disengagement occurred (Figure 1) was 58% during the tangible condition (range, 10% to 100%), 57% during the escape condition (range, 3% to 100%), 44% during the attention condition (range, 3% to 100%), and 0% during the play condition. The percentage of 30-s intervals in which noncompliance occurred (Figure 2) was 60% during the tangible condition

(range, 10% to 100%), 60% during the escape condition (range, 10% to 100%), 55% during the attention condition (range, 20% to 100%), and 0% during the play condition.

Disengagement and noncompliance were graphed separately due to their definitions and the presentation of demands within the functional analysis conditions. Disengagement was defined as 3 s off-task, while noncompliance was failure to respond to teacher instructions within 3 s. Noncompliance could be scored only once for every 30-s interval because demands were only presented once every 30 s, whereas disengagement could be scored more frequently if the student reengaged with the work. In Figure 1, tangible and escape conditions produced the highest levels of disengagement. Similarly, in Figure 2, the highest levels of noncompliance were found during the tangible and escape conditions.

Functional Analysis Procedure Fidelity

The researcher implemented an average of 97.6% of all steps correctly (range, 93% to 100%). Reliability data was also collected during one session on the fidelity checklist with reliability at 100%.

Student Outcomes

Figure 3 displays engagement data comparing baseline to the use of a written schedule (i.e., intervention). Along the x-axis are nonconsecutive days and along the y-axis are the percentage of intervals the student was engaged in the academic activity. The phases are baseline, modified baseline, intervention, and reinstatement of intervention.

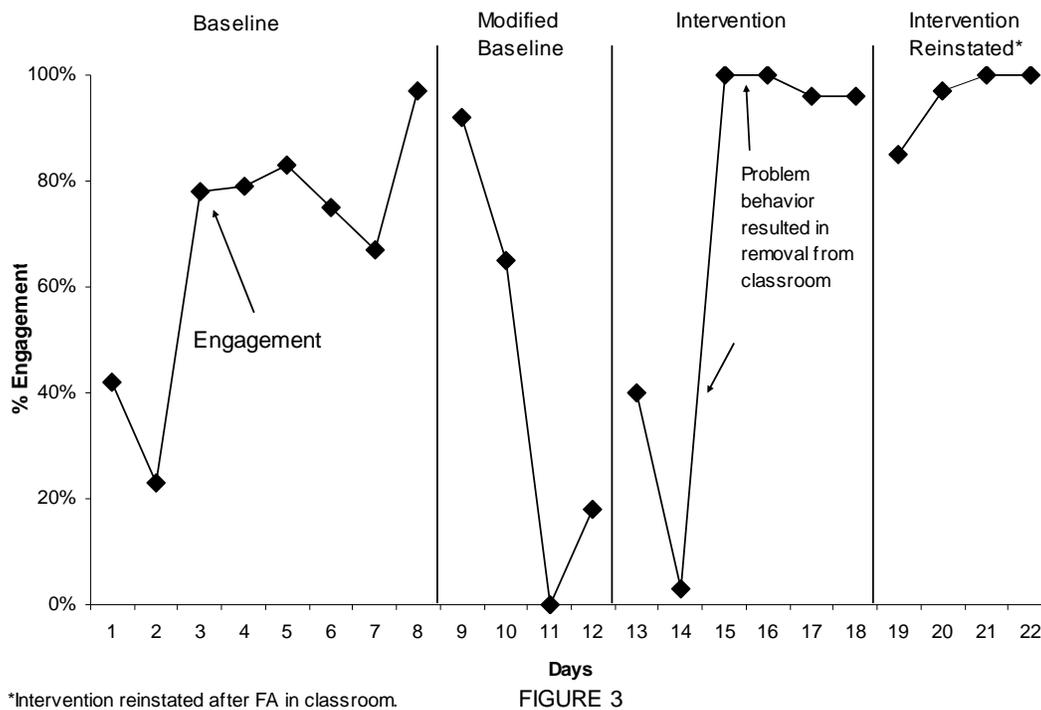
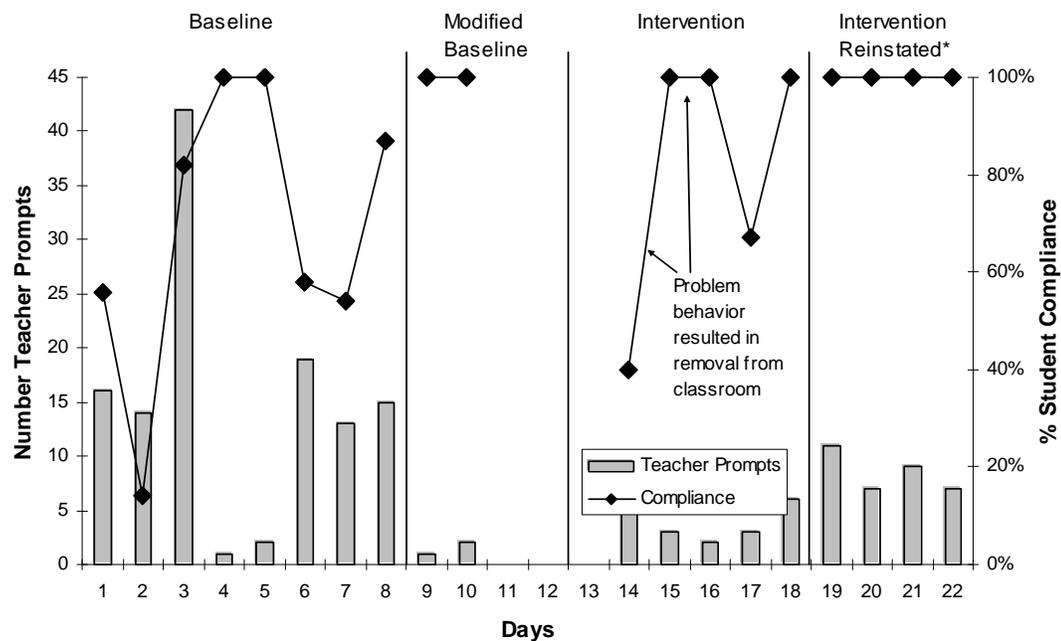


FIGURE 3

The mean percentages of intervals of academic engagement were 68% in baseline (range, 23% to 97%), 44% in modified baseline (range, 0% to 92%), 73% in intervention (range, 3% to 100%), and 96% in intervention reinstatement (range, 85% to 100%). Student engagement in baseline and modified baseline was more variable than in intervention and maintenance with only 2 of 8 days in baseline and 1 of 4 sessions in modified baseline above 80% of intervals engaged. Schedule use produced higher and more stable rates of student engagement with 4 of 6 days during intervention and 4 of 4 days during reinstatement of intervention above 80% of intervals engaged.

Figure 4 displays compliance data again comparing baseline to the use of a written schedule (i.e., intervention). Along the x-axis are nonconsecutive days and along the y-axis are the number of teacher prompts and the percentage of times the

student complied with the teacher prompts per 10-min session. The mean numbers of teacher prompts per 10-min session were 15 in baseline (range, 1 to 42), 1 in modified baseline (range, 0 to 2), 3 in intervention (range, 0 to 6), and 9 in intervention reinstatement (range, 7 to 11). The mean percentages of student compliance per 10-min session were 69% in baseline (range, 14% to 100%), 100% in modified baseline (across four days), 81% in intervention (range, 40% to 100%), and 100% in intervention reinstatement (across four days).



*Intervention reinstated after FA in classroom.

FIGURE 4

Reliability

Reliability for noncompliance during the FA was 93% (range, 80% to 100%) for all conditions. Reliability for disengagement during the FA was 100% for all conditions. Reliability for academic engagement was 96% (range, 93% to 100%). Reliability for number of teacher prompts was 96% (range, 88% to 100%). Reliability

for student compliance was 88% (range, 53% to 100%).

Teacher Reports

On the first day that teacher reports were used, the teacher reported difficulty getting the student started and poor engagement in the assignment, as well as delivering a moderate number of prompts. These ratings matched the observation that the student was engaged only 3% of the time and the teacher provided 5 prompts in 10 min. During intervention, the teacher reported 2 days (between days 14 and 15) as “good” (only fours and fives across all rating scales) and 2 days (day 14 and between days 15 and 16) as “poor” (threes or lower across all rating scales). The checklist completed during the intervention reinstatement phase (between days 24 and 25) reported all fives.

Discussion

This study successfully used the system suggested by Crone and Horner (2003) for conducting a FBA in the school setting. A hypothesis was developed based upon both a simple and full FBA and a function based intervention was implemented that successfully increased the student’s engagement and compliance.

FBA Procedures

As per Crone and Horner (2003), a simple FBA using a brief functional assessment interview was conducted to describe the student’s behaviors and their antecedents and consequences. The teacher stated that the student did not work independently and was prompt dependent to get work completed. The teacher listed writing time as especially difficult for the student and reported that the student

engaged in problem behaviors to receive teacher prompts and to avoid the work. The teacher indicated that the student communicated using complete sentences the majority of the time. She also identified books as being a high preference item for the student. Based on the interview with the teacher, the suggested functions of the student's behavior were escape and attention. However, this hypothesis was inconclusive because it was unclear from the interview as to whether attention or escape or a combination of the two was the main variable maintaining behavior. Direct observations (i.e., baseline data) were conducted as part of a full FBA to gather more information.

Direct Observation

During direct observation, which served as a baseline condition, the researcher observed the student's behavior in order to better determine the functions of his noncompliance and disengagement. Carr, Yarbrough, and Langdon (1997) discussed the importance of direct observation in identifying potential idiosyncratic stimuli that may lead to false FA results. In the current study, although the student received attention in the form of prompts for his behavior, additional behaviors eventually led to removal of the demand and access to the books in the safe seat. When in the safe seat, the student would always read a book and did not engage in any other activities or escalated behaviors while he remained there. As Carr et al., (1997) described, tangible items (i.e., books) in the classroom seemed to affect the student's behavior. These observations led the researcher to develop a hypothesis stating the probable function of the student's behavior was access to tangible reinforcement (i.e., books)

confounded with escape and attention.

Modified Baseline

To confirm attention as a possible function of behavior and thus build confidence in the researcher's hypothesis, a modified baseline was constructed to limit the amount of attention the student received. This condition also served to reduce the variability of the number of teacher prompts. The teacher reported that without prompts, the student would not complete any work. In order to get a stable level of prompts and observe the student's resulting levels of engagement, prompts were removed for the modified baseline. During the first two days of the modified baseline, the teacher occasionally delivered prompts, but prompts were entirely absent from the last two modified baseline observations. The student's engagement decreased without the presence of teacher prompts suggesting that teacher attention had an effect on behavior. The researcher and teacher agreed upon a hypothesis that attention, escape, and access to tangibles all were functions of the student's problem behaviors.

Intervention

Based on the data collected during the simple and full FBAs, an intervention was developed to address the functions of attention, escape, and access to tangibles that were maintaining the student's problem behaviors. The intervention consisted of a written activity schedule that provided cues to the student on how long or how much work he must complete before earning a break. Observations made during baseline suggested that access to books, in addition to escape, was a possible function

of the student's noncompliant and disengaged behaviors. The box of books was added as a reward for completing the schedule to address the probable function of the behavior as determined by the researcher's observations – access to tangibles (i.e., books).

Ideally, escape would have been addressed through the use of physical prompts from the teacher to the student to complete the work and the student would not be sent to the safe seat, thereby escaping the work, for noncompliance or disengagement. However, extinction of escape behaviors was not possible because of the teacher's concern that the student's previous aggressive behaviors, eliminated prior to this study, would return if the student could not use the safe seat and books to cool down. The teacher instead agreed to limit the books available to the student in the safe seat to nonpreferred topics. Therefore, the intervention did not prevent the student from temporarily escaping the writing assignments. Instead, the intervention provided a visual instead of verbal prompt as to what had to be completed in order to take a break with the preferred books. The intervention also provided the student a way of appropriately gaining attention by showing the teacher his completed schedule in order to gain access to the box of books. Also, the intervention directed the teacher to attend to the student when he completed his work and to refrain from frequent prompting.

Prior to introducing the written activity schedule during intervention, an informal assessment was conducted by the teacher to determine if the student was able to follow written instructions. The teacher presented the student with a short

checklist of six items the student was likely to comply with: touch your nose, stand up, touch your feet, sit down, go get a book, and go sit on the beanbag. With only the verbal instruction to follow the directions and mark off the tasks as he completed them, the student was able to read and complete each item and then mark that he had completed each step. We concluded that the student would be capable of using a written schedule instead of a picture schedule.

A written activity schedule was used for two reasons. First, evidence exists that students with Autism Spectrum Disorders are better able to attend to visual stimuli than spoken directions (Quill, 1995). The student generally did not follow classroom instructions unless the instructions were delivered individually to him. Second, when working with a teacher or paraprofessional, the student often asked when they would be done working. No information was provided to the student on the amount of work he was expected to complete, so the work schedule provided that information. Mesibov et al. (2002) noted the benefits of using a schedule that communicates the amount of work required to the student with autism. Quill (1995) discussed how visual representation of work requirements allows the student with autism to better organize his time and work independently.

Previous research indicates that written schedules can result in more compliance than picture schedules for some individuals (Lalli et al., 1994). A written schedule may be more easily generalizable to other settings and may appear less stigmatizing than a picture schedule. Since this student read on a fourth grade reading level and enjoyed reading books, a written schedule rather than a picture schedule

was attempted. Results concurred with Lalli et al. with increased compliance during use of the schedule.

Previous research has also suggested that allowing individuals to make choices about the activities they will perform increases task engagement (Seybert et al., 1996; Watanabe & Sturmey, 2003). Student choice was used in setting the requirements (number of min vs. number of sentences). During intervention, work requirements remained low (5 min - 10 min; 1 sentence - 3 sentences). The amount of time and work required can be gradually increased, though it was not addressed in this study.

Data during intervention showed initially variable student engagement. Student engagement was high for the last four days of intervention and student compliance was high three of the last four days of intervention. A slight increasing trend exists in the number of teacher prompts. This may reflect a return to baseline levels of prompts on the part of the teacher. However, the number of prompts delivered remained lower than in baseline.

Teacher Reports

During the intervention phase, state testing prohibited the researcher from conducting observations. On these days, the teacher completed a brief fidelity checklist and satisfaction survey (Appendix E) on the student's use of the schedule during writing time. These data were obtained for a total of 5 days – 4 during the intervention phase and 1 during the reinstatement of intervention phase of the study. On the second day of intervention, the teacher completed the checklist and

observational data was also recorded to assess agreement between teacher ratings and researcher observations. The teacher report completed on that day fit with the observational data collected. Teacher reports were low during initial intervention, but improved during reinstatement of intervention.

Functional Analysis

Initial data collected during intervention suggested unstable levels of student engagement. Teacher reports showed variability in the student's engagement. Additionally, two days of observation by the researcher resulted in incomplete sessions due to the extremely high levels of student inappropriate behaviors, such that the student was removed from the room before sufficient data could be collected between the 14th and 15th days and between the 15th and 16th days. Northup, Wacker, Berg, Kelly, Sasso, and DeRaad (1994) discussed the importance of conducting a functional analysis in order to accurately determine the maintaining functions of behavior. Lalli et al. (1993) also conducted a functional analysis after the start of intervention to confirm the hypothesis developed from the FBA. In the current study, although the last three days of data during the intervention showed high levels of student engagement, the functional analysis was conducted to remove doubt on the teacher's part and therefore improve the odds of future teacher cooperation.

Analogue conditions provided confirmation that the target behaviors were sensitive to attention, escape, and tangible reinforcement. On the third day of the FA, tangible reinforcement (i.e., book) was presented in sessions 9 and 10 (i.e., tangible and play) and unavailable in sessions 11 and 12 (i.e., attention and escape). The high

levels of disengagement and noncompliance in the escape condition may have been due to an extinction burst because tangible reinforcement (i.e., book) was now being withheld after previous exposure. On the fourth day of the FA, the play condition was presented first, followed by the attention, escape and finally, tangible conditions. Again, the high rates may have been due to an extinction burst because tangible reinforcement (i.e., book) was previously available (session 13) and was then withheld. Throughout sessions 9-16, observers and the researcher noted the student verbally requesting the book in all sessions except play, where the student had free access to the book. Tangible and escape conditions produced very similar levels of target behaviors probably due to the confounding of the conditions because gaining access to reading a book also involved escaping the demand. Several researchers have addressed the issue of false conclusions drawn from a FA due to behavior maintained by multiple variables (Peck-Peterson, Caniglia, & Royster, 2001), extinction of behavior from previous conditions (Iwata, 1994; Iwata et al., 1994/1982), carryover from one condition to another (Charlop-Christy & Haymes, 1998; O'Reilly, Sigafos, Lancioni, Edrishinha, & Andrews, 2005), confounding of attention and tangible conditions (Moore et al. 2002), and testing conditions that are not naturally occurring (Shirley, Iwata, & Kahng, 1999). Although this FA dealt with all of these issues, the intervention successfully reduced problem behaviors. Therefore, false FA conclusions are unlikely regarding the student's sensitivity to escape, tangible, and attention reinforcement.

Student Outcomes

The results of the functional analysis suggested that all conditions affected the student's behavior, with the target behaviors most sensitive to tangible and escape reinforcement, followed by attention. The original intervention sufficiently addressed each of these functions and the teacher reported confidence in the intervention once the functional analysis supported the hypothesis. Gaining appropriate access to tangibles was provided for sufficient work completion (i.e., box of books). Escape, although not directly extinguished, was addressed by providing the student with a visual prompt (i.e., schedule) as opposed to a verbal prompt (i.e., teacher instructions) on the amount of work to be completed before classroom breaks. Attention was also addressed by providing the student with the opportunity to receive teacher attention upon completion of his work (i.e., the teacher could check his work and provide access to the box of books).

Once the functional analysis confirmed the functions of the student's behaviors and the intervention was deemed to appropriately address all the functions, the teacher reinstated the written activity schedule as in intervention. Student engagement returned to levels comparable to those during prior intervention. Results are consistent with prior research that produced an increase in engagement with the use of an activity schedule (e.g., Bryan & Gast, 2000; MacDuff et al., 1993; O'Reilly et al., 2005). Additionally, student compliance achieved high and stable levels with intervention as previous research has shown (e.g., Dettmer et al., 2000; Lalli et al., 1994). Teacher prompts increased from intervention, possibly as a result of the teacher and paraprofessionals returning to their previous habits of prompting.

Although not represented in the data, the researcher and observers noted a change in topography of teacher prompts from more instructional prompts (i.e., “Keep working,” “Move on to the next one,” etc.) to more conversational and general prompts (i.e., “What’s next in your story?” “You’ve only got X more to do before you’re finished,” etc.). Although the choice component of the intervention was not directly measured, increased engagement and decreased problem behaviors are consistent with research on choice (e.g., Dyer et al., 1990; Seybert et al., 1996).

Limitations

One limitation of this study was that the researcher conducted the functional analysis, rather than school staff. Although the functional analysis was conducted within the classroom and during the regular writing time, the teacher did not run the conditions or deliver the consequences. Due to time constraints on both the researcher and the teacher, the teacher was not trained to conduct the functional analysis. Future research should continue to address ways to use functional analysis methodology in classroom settings, including training teachers to conduct functional analyses in the classroom with the assistance of a consultant or school psychologist (Moore et al., 2002; Mueller et al., 2003).

Another limitation was the lack of a reversal design. Due to lack of time left in the academic calendar before the school’s summer break, the functional analysis was conducted instead of a reversal condition. The functional analysis was conducted within the last month of school and we decided that withholding treatment in order to conduct a reversal condition was not appropriate. Future research should address how

to best meet the applied needs of the setting, while maintaining experimental control.

Although this study demonstrated an increase in student engagement following the intervention of a written activity schedule, the generality of these findings is limited. The study did not address the use of a more complex schedule with various academic subjects across the day and assignments or in other settings besides the special education classroom. Also, the study only had only one participant receive the intervention. Future research should examine the use of more complex schedules in various school settings, as well as continue to identify the benefits of activity schedule use across multiple individuals.

Conclusions

The study addressed three primary questions. First, would a function based intervention, based on the results of a FBA, be effective in modifying the behavior of a student with autism in a special education classroom? This study showed that a function based intervention developed from the FBA successfully increased the engagement and compliance of a fourth grade student with Asperger's. This study also expanded the existing body of literature on the use of activity schedules by using a written as opposed to picture schedule to increase academic engagement in an elementary student with Asperger's syndrome. This intervention successfully increased the student's engagement during individual writing assignments, while keeping teacher prompts at low levels.

Second, would the results of a functional analysis in the classroom support the hypothesis generated from a preceding FBA interview? The hypothesis developed

through the FBA was confirmed by a functional analysis conducted in the classroom. This study successfully demonstrated the use of a functional analysis in a special education classroom during the regular writing session, a naturalistic approach to FAs. The results confirmed the probable functions of behavior identified through a functional assessment interview and direct observations. The functional analysis also demonstrated the ability to measure disengagement and noncompliance as target behaviors.

Third, how effective is the full process of Crone and Horner (2003) in developing and implementing function based interventions in school settings? This study demonstrated the steps in the full FBA process. At each step, a decision was made to continue the FBA process or begin intervention based upon the strength of the hypothesis. This model was effective at successfully addressing the needs of both the student and the teacher.

The findings suggest the use of activity schedules as an effective intervention for students with behaviors sensitive to multiple reinforcers (i.e., attention, escape, tangibles). More research is needed to demonstrate the efficiency of FBA in determining function based intervention, and when functional analysis is needed (i.e., when FBA based intervention results are variable) (Ervin, Fugua, et al., 2001; Ervin, Radford, et al., 2001). Recommendations also include continued use of FBA and FA procedures involving school staff in natural settings such as classrooms.

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Appendix A1

FUNCTIONAL ANALYSIS INTERVIEW FORM

Person with challenging

behavior(s) _____

Age _____ Sex M F

Interviewer _____

Respondent(s) _____

Date of Interview _____

A. DESCRIBE THE BEHAVIOR(S)

1. What are the behaviors of concern? For each, define the topography (how is it performed), frequency (how often it occurs per day, week, or month), duration (how long it lasts when it occurs), and intensity (what is the *magnitude* if the behaviors [low, medium, high]? Does it cause harm?).

Behavior

Topography

Frequency

Duration

Intensity

1. _____

2. _____

3. _____

4. _____

5. _____

2. Which of the behaviors described above occur together? (e.g., occur at the same time; occur in a predictable “chain”; occur in response to the same situation)

B. DEFINE POTENTIAL ECOLOGICAL EVENTS THAT MAY AFFECT

THE BEHAVIOR(S)

1. Briefly list below the person's typical daily schedule of activities.

8:00 _____

9:00 _____

10:00 _____

11:00 _____

12:00 _____

1:00 _____

2:00 _____

3:00 _____

4:00 _____

2. Describe the extent to which you believe activities that occur during the day are *predictable* for the person. To what extent does the person know the activities that will be happening, when they will occur, and the consequences (e.g., when to get up, eat dinner, shower, go to school/work, etc.)?

C. DEFINE EVENTS AND SITUATIONS THAT PREDICT OCCURRENCES

OF THE BEHAVIOR(S)

1. Setting: Where are the behaviors most likely? Least likely?

Most likely

Least likely

2. Social Control: With whom are the behaviors most likely? Least likely?

Most likely

Least likely

3. Are there particular situations, events, etc. that are not listed above that “set off” the behaviors that cause concern (particular demands, interruptions, transitions, delays, being ignored, etc.)?

D. IDENTIFY THE “FUNCTION” OF THE UNDESIRABLE BEHAVIOR(S).
WHAT CONSEQUENCES MAINTAIN THE BEHAVIOR(S)?

1. Think of each of the behaviors listed in Section A, and define the function(s) you believe the behavior serves for the person (i.e., what does he/she get and/or avoid by doing the behavior?)

<u>BEHAVIOR</u>	<u>WHAT DOES HE/SHE GET</u>	<u>WHAT DOES HE/SHE AVOID</u>
1. _____		
2. _____		

3. _____

4. _____

2. Describe the person's most typical response to the following situations.

- a. Are the above behavior(s) more likely, less likely, or unaffected if you present him/her with a difficult task?
- b. Are the above behavior(s) more likely, less likely, or unaffected if you interrupt a desired event (eating ice cream, watching TV)?
- c. Are the above behavior(s) more likely, less likely, or unaffected if you deliver a "stern" request/command/reprimand?
- d. Are the above behavior(s) more likely, less likely, or unaffected if you are present but do not interact with (ignore) the person for 15 minutes?
- e. Are the above behavior(s) more likely, less likely, or unaffected by changes in routine?
- f. Are the above behavior(s) more likely, less likely, or unaffected if something the person wants is present but he/she can't get it (i.e., a desired object that is visible but out of reach)?
- g. Are the above behavior(s) more likely, less likely, or unaffected if he/she is alone (no one else is present)?

E. PROVIDE A HISTORY OF THE UNDESIRABLE BEHAVIORS AND THE PROGRAMS THAT HAVE BEEN ATTEMPTED

Behavior	How long has this been a problem?	Programs	Effect
----------	--------------------------------------	----------	--------

1. _____
2. _____
3. _____
4. _____
5. _____

F. DEFINE THE PRIMARY METHOD(S) USED BY THE PERSON TO COMMUNICATE

1. What are the general expressive communication strategies used by or available to the person? (e.g., vocal speech, signs/gestures, communication books/boards, electronic devices, etc.) How consistently are the strategies used?
2. With regard to receptive communication ability:
 - a. Does the person follow verbal requests or instructions? If so, approximately how many? (List if only a few).
 - b. Is the person able to imitate physical models for various tasks or activities? (List if only a few).
 - c. Does the person respond to signed or gestural requests or instructions? If so, approximately how many? (List if only a few).
 - d. How does the person indicate *yes* or *no* (if asked whether he/she wants to do something, go somewhere, etc.)?

Appendix B

FA Data Sheet

Page 1

1 minute

10	1	20	2	30	3	40	4	50	5	60	6
P	C	N	P	C	N	P	C	N	P	C	N
P	C	N	P	C	N	P	C	N	P	C	N
A+	R	Pr	A+	R	Pr	A+	R	Pr	A+	R	Pr
A-	E	D	A-	E	D	A-	E	D	A-	E	D

2 minutes

10	7	20	8	30	9	40	10	50	11	60	12
P	C	N	P	C	N	P	C	N	P	C	N
P	C	N	P	C	N	P	C	N	P	C	N
A+	R	Pr	A+	R	Pr	A+	R	Pr	A+	R	Pr
A-	E	D	A-	E	D	A-	E	D	A-	E	D

3 minutes

10	13	20	14	30	15	40	16	50	17	60	18
P	C	N	P	C	N	P	C	N	P	C	N
P	C	N	P	C	N	P	C	N	P	C	N
A+	R	Pr									
A-	E	D									

4 minutes

10	19	20	20	30	21	40	22	50	23	60	24
P	C	N	P	C	N	P	C	N	P	C	N
P	C	N	P	C	N	P	C	N	P	C	N
A+	R	Pr									
A-	E	D									

5 minutes

10	25	20	26	30	27	40	28	50	29	60	30
P	C	N	P	C	N	P	C	N	P	C	N
P	C	N	P	C	N	P	C	N	P	C	N
A+	R	Pr									
A-	E	D									

P = Teacher Prompt
 C = Student Compliance
 N = Student Noncompliance
 A+ = Teacher Attention to Positive
 A- = Teacher Attention to Negative
 D = Student Disengaged
 E = Student Engaged
 R = Removed Materials
 Pr = Presented Tangible

Date:

Condition:

Observer:

Notes:

Page 2

1 minute

10	31	20	32	30	33	40	34	50	35	60	36
P	C	N	P	C	N	P	C	N	P	C	N
P	C	N	P	C	N	P	C	N	P	C	N
A+	R	Pr									
A-	E	D									

2 minutes

10	37	20	38	30	39	40	40	50	41	60	42
P	C	N	P	C	N	P	C	N	P	C	N
P	C	N	P	C	N	P	C	N	P	C	N
A+	R	Pr									
A-	E	D									

3 minutes

10	43	20	44	30	45	40	46	50	47	60	48
P	C	N	P	C	N	P	C	N	P	C	N
P	C	N	P	C	N	P	C	N	P	C	N
A+	R	Pr									
A-	E	D									

4 minutes

10	49	20	50	30	51	40	52	50	53	60	54
P	C	N	P	C	N	P	C	N	P	C	N
P	C	N	P	C	N	P	C	N	P	C	N
A+	R	Pr									
A-	E	D									

5 minutes

10	55	20	56	30	57	40	58	50	59	60	60
P	C	N	P	C	N	P	C	N	P	C	N
P	C	N	P	C	N	P	C	N	P	C	N
A+	R	Pr									
A-	E	D									

P = Teacher Prompt
 C = Student Compliance
 N = Student Noncompliance
 A+ = Teacher Attention to Positive
 A- = Teacher Attention to Negative
 D = Student Disengaged
 E = Student Engaged
 R = Removed Materials
 Pr = Presented Tangible

Date:

Condition:

Observer:

Notes:

Appendix C

Functional Analysis

Fidelity of Implementation

Were all the materials ready before beginning each condition?

Were the conditions run in the appropriate order?

Attention Condition:

Y/N Did the session begin with the student seated at the table?

Y/N Did the researcher place an assignment in front of the student?

Y/N Was the student told to complete work while researcher was busy?

Y/N After issuing the initial instruction, did the researcher divert her attention?

Y/N Was attention delivered upon the emission of the target behavior?

Y/N Was attention delivered for non-target behaviors?

Y/N Did attention take the form of demands?

Y/N/Na Did the researcher stop the session if someone was hurt or in danger?

Escape Condition:

Y/N Did the session begin with the student seated at the table?

Y/N Did the researcher place an assignment in front of the student?

Y/N Was the student told to complete the work?

Y/N Were the materials removed upon the emission of the target behavior?

Y/N Were the materials removed for non-target behaviors?

Y/N Was a new demand presented at the beginning of each 30 second interval?

Y/N/Na Did the researcher stop the session if someone was hurt or in danger?

Tangible Condition:

- Y/N Did the session begin with the student seated at the table?
- Y/N Did the researcher place an assignment in front of the student?
- Y/N Was the student told to complete the work?
- Y/N Was the book delivered upon the emission of the target behavior?
- Y/N Was the book delivered for non-target behaviors?
- Y/N Was the book removed at the end of each 30 second interval?
- Y/N/Na Did the researcher stop the session if someone was hurt or in danger?

Play Condition:

- Y/N Did the researcher direct the client to leisure materials at the beginning?
- Y/N Were any demands placed on the student?
- Y/N Did the student have continuous access to the leisure items?
- Y/N Was attention delivered at least once every 30 second interval?
- Y/N Was attention delivered within 5 seconds of target behavior?
- Y/N/Na Did the researcher stop the session if someone was hurt or in danger?

Appendix D

Interval Data Sheet

Page 1

1 minute

10	1	20	2	30	3	40	4	50	5	60	6
P	C N	P	C N	P	C N	P	C N	P	C N	P	C N
P	C N	P	C N	P	C N	P	C N	P	C N	P	C N
P	C N	P	C N	P	C N	P	C N	P	C N	P	C N
	B A		B A		B A		B A		B A		B A
L	1on1										
S	Ind										

2 minutes

10	7	20	8	30	9	40	10	50	11	60	12
P	C N	P	C N	P	C N	P	C N	P	C N	P	C N
P	C N	P	C N	P	C N	P	C N	P	C N	P	C N
P	C N	P	C N	P	C N	P	C N	P	C N	P	C N
	B A		B A		B A		B A		B A		B A
L	1on1										
S	Ind										

3 minutes

10	13	20	14	30	15	40	16	50	17	60	18
P	C N	P	C N	P	C N	P	C N	P	C N	P	C N
P	C N	P	C N	P	C N	P	C N	P	C N	P	C N
P	C N	P	C N	P	C N	P	C N	P	C N	P	C N
	B A		B A		B A		B A		B A		B A
L	1on1										
S	Ind										

4 minutes

10	19	20	20	30	21	40	22	50	23	60	24
P	C N	P	C N	P	C N	P	C N	P	C N	P	C N
P	C N	P	C N	P	C N	P	C N	P	C N	P	C N
P	C N	P	C N	P	C N	P	C N	P	C N	P	C N
	B A		B A		B A		B A		B A		B A
L	1on1										
S	Ind										

5 minutes

10	25	20	26	30	27	40	28	50	29	60	30
P	C N	P	C N	P	C N	P	C N	P	C N	P	C N
P	C N	P	C N	P	C N	P	C N	P	C N	P	C N
P	C N	P	C N	P	C N	P	C N	P	C N	P	C N
	B A		B A		B A		B A		B A		B A
L	1on1										
S	Ind										

- P = Teacher Prompt
- C = Student Compliance
- N = Student Noncompliance
- B = Beanbag
- A = Academic Work
- L = Large Group
- S = Small Group
- Ind = Individual Work
- 1on1 = One on One with Teacher

Date:

Time:

Subject:

Observer:

Appendix E

Schedule Fidelity and Satisfaction Survey

Teacher

- Presented schedule
- Prompted student to read out loud
- Kept prompts to a minimum
- Prompted placement of “yes” sticker
- Delivered reinforcer box

Student

- Looked at schedule
- Read schedule out loud
- Worked independently
- Placed “yes” sticker on board
- Earned access to reinforcer box

Please rate each scale as honestly and objectively as possible.

Ease of Presentation

1	2	3	4	5
very difficult	somewhat difficult	neither	somewhat easy	very easy

Student Resistance

1	2	3	4	5
very strong	strong	mild	little	very little

Time Engaged in Activity

1	2	3	4	5
none of the time	little of the time	some of the time	most of the time	all of the time

Number of Prompts

1	2	3	4	5
---	---	---	---	---

all	many	some	few	no
prompted	prompts	prompts	prompts	prompts

Work Completed in Timely Manner

1	2	3	4	5
no	little	some	moderate	all required
work	work	work	work	work

Amount of Time Spent on Lesson: _____

Amount of Work Required for Box: _____

Amount of Work Actually Completed: _____

Notes/Comments: _____
