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Training Early Childhood Educators to Identify Behavior Function and Select Function-Matched Interventions

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TRAINING EARLY CHILDHOOD EDUCATORS TO IDENTIFY BEHAVIOR FUNCTION AND SELECT FUNCTION-MATCHED INTERVENTIONS

by

Laura V. Cox

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ABSTRACT

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by

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Prior researchers have shown that school-aged staff can identify behavior function and function-matched interventions following training. Limited research has been done with preschool staff on the process of identifying function of behavior and selecting function-matched interventions to decrease problem behavior. A multiple baseline across participants' design was used to measure preschool teachers' accuracy of identification of behavior function and function-matched interventions. Participants analyzed descriptive data to identify function of behavior and select function-matched interventions. Results from this study demonstrated that preschool teachers can independently identify function-matched and nonfunction matched interventions with greater accuracy after training.

(49 pages)

PUBLIC ABSTRACT

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Laura V. Cox

Problem behavior in the classroom can have a negative impact not only on the student's learning but on his or her social interactions and the child may risk rejection by teachers and peers. This study evaluated the effects of a training package delivered to preschool teachers on their ability to identify what may be causing the problem behavior and identify strategies that may reduce problem behavior.

Previous research has demonstrated the effectiveness of this training package in older age groups or grade levels as well as to other professionals who work with children with problem behavior. Results from this study produced similar effects to previous research, that preschool teachers can increase accuracy of identifying strategies that may reduce problem behavior in the classroom in young children after training.

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Laura V. Cox

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CHAPTER I

INTRODUCTION

Challenging behavior demonstrated by young children can have negative effects on academic development and social interactions in early childhood settings with both peers and adults (Wood, Drogan, & Janney, 2014). Young children engaging in problem behavior are at risk for peer and teacher rejection or removal from the general education setting (LaRocque, Brown, & Johnson, 2001; McLaren & Nelson, 2009). Many studies have emphasized the importance of determining the function of the behavior in order for interventions to be most effective in producing desired behavior change (Bloom, Iwata, Fritz, Roscoe, & Carreau, 2011; Bloom, Lambert, Dayton, & Samaha, 2013; Dozier & Iwata, 2008; Iwata, Dorsey, Slifer, Baumann, & Richman,1982; Iwata et al.,1994; Lambert, Bloom, & Irvin, 2012; Wood et al., 2014). Behavior function is defined as any reinforcing stimuli that maintain behavior over time (Iwata et al., 1982/1994).

Inaccurate identification of a behavior function can lead to detrimental outcomes for the individual, such as development of ineffective interventions, increases in problem behavior, and dangerous situations for students and staff in the classroom (Iwata et al., 1982, 1994). Alternatively, when the function of a behavior is correctly identified, problem behavior can decrease and functionally equivalent replacement behaviors can be targeted for increase (Morgan, Sellers, & Keyl, 2009). Without targeted training or understanding of behavior function, teachers are left to employ interventions based on whatever knowledge they might have obtained from various sources. For example, they may employ a “one-size fits all” intervention or “recipe approach” indicating that the

professional is using a set of strategies with little consideration as to their rationale (Foxx, 1996). Without a function-based assessment, educators often find that interventions do not work and may lead to an unintentional and unwanted increase in problem behaviors (Morgan et al., 2009). School environments can be unpredictable and difficult to control for all variables of reinforcement. Teachers and other students can be potential sources for unwanted reinforcement. By understanding function of behavior, this allows teachers to control some environmental factors and possibly avoid irrelevant or contraindicated interventions that may otherwise be practical interventions options (Grow, Carr, & LeBlanc, 2009).

Despite the fact that research clearly demonstrates that optimal outcomes are achieved by first identifying the function of the problem behavior and then using that information to select an intervention, school personnel still have difficulties identifying and implementing function based interventions (Blood & Neel, 2007; Borgmeier, Loman, Hara, & Rodgriquez, 2015; Scott, Liaupsin, Nelson, & McIntyre, 2005; Van Acker, Boreson, Gable, & Potterton, 2005). It is important for educators to successfully identify the function of behavior and select appropriate, effective, evidence-based interventions when dealing with problem behavior.

There are three main types of functional behavior assessments (FBA) used to determine what reinforcer is maintaining problem behavior. The first type is an indirect functional assessment involving measures such as checklists, rating scales, interviews or questionnaires. Second, a descriptive functional behavior assessment involves employing direct observation of behavior and recording antecedents, behavior and consequences

within the natural environment. Third, a functional analysis (FA) includes systematically manipulating the antecedents and consequences that may trigger problem behavior (Cooper, Heron, & Heward, 2007; Iwata et al., 1982, 1994).

Educators need to conduct high quality FBAs so that they can select and implement function-targeted interventions aimed at reducing problem behavior in the classroom by teaching socially appropriate alternative behaviors that serve the same function as problem behavior. Although research has demonstrated that behavior practitioners (BCBA, BABA-D, and BCaBA) agree that a FA is the most effective method to identify the function of behavior, even the best-trained professionals use FA methods inconsistently (Oliver, Pratt, & Normand, 2015; Roscoe, Phillips, Kelly, Farber, & Dube, 2015). The most commonly used method in practice is the descriptive assessment (Desrochers, Hile, & Williams-Moseley, 1997; Ellingson, Miltenberger, & Long, 1999; Oliver et al., 2015; Roscoe et al., 2015).

Past researchers have demonstrated that preschool teachers can effectively implement FBA in the classroom after training and with support from a professional (Wood et al., 2014). However, often the researcher or other professional (e.g. BCBA or psychologist) take the lead role in the FBA process. According to a literature review examining teacher involvement in the FBA process (Wood et al., 2014), none of the 30 studies reviewed included teachers taking a lead role in the process. Moreover, only three specifically provided complete descriptions of the teacher training procedures and components. Eleven studies included teacher participation in FBA data analysis, but only as part of a collaborative team with the researcher taking the lead in identifying the

function of behavior and the function-based interventions. No studies found during the search demonstrated teacher efficacy, after receiving in-service training, on the independent identification of the function and the selection of a function-matched intervention for the classroom. Research is needed on the effectiveness of training teachers to take a lead role in identifying the function of behavior and then selecting the most appropriate basic interventions that address the function of problem behavior.

CHAPTER II

LITERATURE REVIEW

Using Google Scholar and EBSCO Host: PsychINFO and ERIC, I searched for literature on the use of descriptive functional assessments in schools and teacher involvement in the interpretation of FA data and selection of interventions. Using the search terms: *descriptive analysis and teacher and function based intervention*, PsychINFO and ERIC yielded 53 results. I then searched Google Scholar and yielded 130,000 results. With such a large number of results, I narrowed my search by adding in *since 2011* to Google Scholar with 4,608 results. I then began to peruse the results and selected studies that dealt with teachers' participation (a) in determining function of behavior, (b) the interpretation of functional assessment data to determine appropriate interventions, (c) in preschool or early childhood settings. Additionally, I examined literature for seminal articles or authors such as Iwata, Hanley, Groden, and Bijou often associated with functional assessment research. Most of the studies were excluded from that search because they were more specific to conducting a FA, excluded teacher/school involvement, or were specific to treatment selection of a specific disability or older age group.

I then narrowed the search even further and put in search terms: *descriptive assessment in preschool*; *behavior assessment training with teachers*; *staff training to implement behavior interventions; descriptive analysis AND conditional probability and preschool.* I also acquired further research by reviewing literature references therein, looking for those key terms or phrases listed above. I found 75 articles that were most

relevant to descriptive assessments and teacher involvement in the interpretation of results and treatment selection. The articles deemed most relevant included those reviewed below.

Early foundational research on functional assessments demonstrated that by using procedures based on (a) direct observations of problem behavior, (b) identifying the function of behavior, and (c) using data collected from behavior assessments to guide intervention decisions, more precise interventions may be developed to decrease problem behavior and increase function-based replacement behavior (Bijou, Peterson, & Ault, 1968; Groden, 1989; Iwata et al., 1982, 1994).

The reauthorization of Individual with Disabilities Education Act (IDEA) in 1997 requires school personnel to conduct functional behavior assessments to guide interventions used in the classroom with students with problem behavior. Although required by law, IDEA provides no guidance on how FBA and function based interventions should be completed. This ambiguity may be a contributing factor as to why school personnel still have difficulty with FBA and implementing effective interventions today (Blood & Neel, 2007; Borgmeier, Loman, Hara, & Rodriquez, 2015; Scott et al., 2005; Van Acker et al., 2005).

Dunlap, Lee, Joseph, and Strain (2015) noted that research over the past decade has focused on using strategies and principles of applied behavior analysis and positive behavior supports (PBS; Bambara & Kern, 2004; Carr et al., 2002; Cooper et al., 2007; Sailor, Dunlap, Sugai, & Horner, 2009). Although much of the research has been conducted with school-age children, similar findings have extended to preschool-aged

children. This is promising because with a shorter learning history, these young children may show more robust results, in terms of rapid problem behavior reduction and acquisition of replacement skills, as well as increased independence in the classroom at an earlier age.

McLaren and Nelson (2009) extended the research on current FBA implementation into a Head Start classroom. Participants in this study included three typically developing male children (Anthony, 44 months; Brian, 40 months; and Carlos, 38 months), two lead classroom teachers and three assistant teachers. FAs were conducted by the researcher and included teacher interview, direct observation with scatter plot, and ABC data. The researcher then met with teachers and assistant teachers to analyze data and determine possible function of behavior. Due to lack of teacher training, the researcher suggested possible functions and reviewed functional assessment data with the teachers. The researcher collaborated with each teacher on function-matched interventions that both agreed were developmentally appropriate and easy to implement within the Head Start classroom. Interventions selected for all three children focused on manipulating antecedent variables and preventing problem behavior from occurring, rather than implementing consequences after the occurrence of problem behavior. Teachers were instructed to respond as they would typically for occurrence of problem behavior for two children of the three children. The third child also had specific procedures for the delivery of consequences for the occurrence of problem behavior.

Data on occurrence of problem behavior were collected using a frequency count for Anthony and Brian and a partial interval system for Carlos. An ABAB reversal design

was used for Anthony and Brian and an ABCAC was used for Carlos to measure the effectiveness of function-based interventions. Results from this study indicated that all interventions were effective for all three children. Anthony's mean rate of inappropriate touching decreased from 0.28 per minute during baseline to 0.07 during intervention. Brian's aggression toward peers decreased from a mean rate of 0.32 per minute during baseline to 0.11 during interventions. Carlos's escape behavior from circle time decreased from a mean of 46.5% during baseline to 2% of intervals after intervention. Teachers were also asked to complete a social validity survey, Treatment Acceptability Rating Form-Revised (TARF-R; Reimers, Wacker, Cooper, & de Raad, 1992) and found that teachers reported they were willing to implement interventions. One teacher expressed concern about sustainability and another teacher indicated that the intervention was "slightly time consuming." This study demonstrated that preschool teachers can be trained to effectively implement function based interventions to reduce/prevent problem behaviors. However, none of the teachers independently analyzed the data to indicate a function nor selected the intervention.

Wood, Ferro, Umbreit, and Liaupsin (2011) extended FBA research into two inclusive preschool classrooms with similar results. Participants in this study were two teachers and three children (Paul, Doug, and Mark). Due to Mark's IEP, his grandmother was also included as a participant in this study. The researcher conducted FBA using teacher/parent interview and direct observation of target behavior. Interventions for each student were created using the *Function-Based Intervention Decision Model*. This model asked two main questions and the answers to those questions directed which intervention

method may be appropriate. The researcher took a lead role in analyzing FBA data and creating interventions. Teachers were included as part of identification of function of the behavior and in creating interventions. The effectiveness of function-matched interventions was measured using a multiple baseline across children design.

Preschool teachers and Mark's grandmother implemented the interventions in the classroom. On-task behavior was collected for all children using 20s whole interval for a total duration of 10 min. Paul, Doug, and Mark's mean on-task behavior during baseline was 11%, 12% and 37% of intervals respectively. With correct implementation of interventions, all children's on-task behavior improved. Mean on-task behavior increased to 99% of intervals for Paul, 81% of intervals for Doug and Paul's was more variable due to fidelity of implementation but reached 90% of intervals with correct implementation. This study demonstrated the use of Decision Model, a guide to assess and identify a skill deficit and/or if changes in antecedent conditions are needed to elicit replacement behavior, is effective to guide function-matched interventions. With training and feedback, teachers and family members can effectively implement interventions with high treatment integrity. However, more research is needed to determine if teachers can learn to identify function from ABC data and then identify a function-matched intervention.

Duda, Dunlap, Fox, Lentini, and Clarke (2004) used a consultation model with support from researchers using Positive Behavior Support (PBS) as described by Hieneman et al. (1999), Horner et al., (2010), and Koegel, Koegel, and Dunlap (1996). Participants were two 3-year-old girls (Vanessa and Layla) who were enrolled in a

community preschool and demonstrated problem behaviors. The researcher conducted FBA interviews and direct observations. The team was comprised of (a) child's parents, (b) preschool teacher, (c) classroom paraprofessional, (d) preschool director, and (e) researcher (PBS consultant) then collaborated to analyze data, determine possible function of behavior and develop function based interventions. An ABAB reversal design was used to determine the effects of PBS interventions on child engagement and problem behaviors. A PBS consultant provided training and coaching to the teacher during the intervention phase. A validity measure was also used to determine classroom teacher and staff's perspective on the use and effectiveness of interventions.

Results from Duda et al. (2004) demonstrated that both participants had higher rates of engagement and lower rates of problem behavior during the intervention phase over baseline. Results from the social validity measures indicated that both teachers were (a) comfortable with implementing the interventions, (b) felt they were effective interventions, and (c) felt they were age appropriate. Researchers noted that although the teachers helped with the development of the interventions, they did not implement all components. Whole classroom modifications or environmental supports were implemented more consistently than strategies that target the individual student by classroom staff.

In the three previous studies, teachers were trained to implement interventions, but were not given any training to use the data to identify a function or a function matched treatment. So, these studies show that with a lot of support from experts who collect and analyze data, and then select an intervention, the teacher can implement the

intervention and the problem behavior can be reduced. This is critical if teachers are going to be more independent in developing and implementing basic function-matched interventions in the classroom, rather than having to wait for help from an expert. Although there may be some cases requiring the support of a behavior expert with a higher level of expertise, most problem behavior that occur in the classroom can be modified and corrected by the classroom teacher who understands and applies function matched treatments. Iovannone et al. (2009) created a model using positive behavior supports to assist educators in identifying and developing function-based interventions called the *Prevent-Teach-Reinforce* (PTR) model. A randomized controlled trial with five school districts from Colorado and Florida were selected to test the efficacy of the PTR model. The participants were children in grades K-8 from both general and special education settings. All participants were identified by his/her teacher as having a serious problem behavior. Researchers notified the teachers of those participants who were selected to receive PTR intervention. Those teachers then met with a PTR consultant (researcher) to assist them in the intervention process. Teachers were assigned readings and corresponding assignments that were discussed at team meetings with the PTR consultant. Using this approach, teachers are asked to assess the fidelity of five classroom-wide practices identified by the researchers as important. The researchers suggested that those practices that are not being implemented with fidelity be implemented prior to or in conjunction with more intensive interventions. Those assigned to the control group were instructed to proceed as usual with current practices. Results revealed that the PTR group demonstrated significant gains from pretest to posttest in

social skills and an academic engagement. This group (PTR) also demonstrated reductions in problem behavior when compared to the services as usual group.

These procedures were later extended by Dunlap et al. (2015) to a younger population. *Prevent-Teach-Reinforce (PTR) for Young Children* is a revised version of the original PTR model but is adapted to fit within the context of early childhood settings and is based on principles of PBS. This model provides a clear written description and step-by-step guide to its implementation in a book format. Although the authors discuss using a team driven approach, rather than an expert driven approach, and describe coaching, due to the limitation of the format, coaching may not be as effective as intended by the authors because coaches may not understand or follow procedures with fidelity.

Training with feedback is critical for teachers to perform skills to a mastery criterion. With effective training on basic behavior principles, teachers may then take more of lead role in employing basic function matched interventions without having to wait for a behavior expert's assessment (Foxx, 1996). There are concerns about educators' reliance on behavior experts because those experts may not know the children or understand the classroom culture, resulting in creation of behavior plans that may be difficult for the educator to understand or implement with fidelity, and nonclassroom experts have limited time to support all students' needs (Foxx, 1996). Other researchers have indicated that use of experts may result in delays to accessing support due to unavailability of the expert (Crone, Hawken, & Bergstrom, 2007; Quinn, Gable, Fox, Van Acker, & Conroy, 2001; Reid & Nelson, 2002; Vaugh, Hales, Bush, and Fox, 1998).

To provide school staff more autonomy to conduct FBA and create behavior support plans (BSP) for individual students within their own schools, Crone et al. (2007) demonstrated the effects of a three-year training package for elementary and middle school teams comprised of (a) school administrator, (b) paraprofessional, (c) general educator to conduct FBA with students and implement and effective BSP. The training package for school staff used Effective Behavior Support (EBS; Sugai & Horner, 1999) and school wide positive behavior support (PBS). School staff pre- and posttest scores demonstrated an increase in scores after training. In another study by Bergstrom, Horner and Crone (2005), individual student data were collected for three students and indicated a decrease in students' disruptive behavior. Although there was an increase on post test scores after training, that may not reflect school staffs' ability or procedural integrity of conducting or implementing FBA or BSP. Teachers need to receive feedback in order to reach a performance criterion after training (Crone et al., 2007).

Although Crone et al. (2007) produced favorable results, 3 years of training may not be feasible for many school teams. Loman and Horner (2014) created a manualized "Basic FBA" training package to train 12 school personnel (e.g. counselors, administrators) to conduct accurate FBAs. Participants completed four 1-hr training sessions. After training, school personnel then conducted FBA with a target student. The researchers validated results from FBA by conducting a FA using a multi-element design across conditions. Results from this study demonstrated that school personnel could meet the criteria in conducting accurate FBA with 100% accuracy. A 100% correspondence was found between FBA and FA identification of behavior function. A social validity

measure was also taken and participants indicated that found this training useful and would suggest this to other school personnel. Although useful in the school setting and with school staff, teachers were excluded from this training.

Borgmeier et al. (2015) extended the training of Loman and Horner (2014) to include 291 school staff. Fifty-seven were general educators and 31 were special educators, the rest were other education professionals (e.g. school psychologist, counselors, and behavior specialists). Training was one hour long and participants filled out pre and post-tests to measure the effectiveness of the training. Participants' accuracy in identifying function matched interventions increased after training. It was noted that even after training, attention-maintained intervention strategies received the lowest accuracy scores. Almost a quarter of the participants selected adult or peers talking with student as an intervention to attention-seeking behavior. The researchers suggested that perhaps this was because the school personnel felt that they had a responsibility to actively do something about problem behavior.

Results from the reviewed literature suggest that preschool educators need more training on interpreting descriptive assessment data sets and how the function of the behavior drives the selection of appropriate interventions. Understanding basic FBA methodology may enable educators to take a more active role in the selection and implementation of function-matched interventions in the classroom, rather than wasting valuable time in waiting for an expert. The loss of a few weeks or even months at the five and under age is not the same as a loss of a few weeks or months for older children. The amount of learning in a short period for children under five is huge. Time that goes by

without appropriate and effective interventions once lost, cannot be equally gained back by simply adding more services later. Therefore, having teacher involvement is essential in improving the quality and appropriateness of an intervention (Lang et al., 2010; Lang & Page, 2011).

The purpose of this study was to extend the current literature on the effects of teacher training using a descriptive functional behavior assessment (FBA) and to assess the accuracy with which teachers can identify the function of behavior and select the most appropriate evidence-based interventions. A descriptive FBA method was selected for this study rather than FA due to (a) teacher's familiarity with this methodology, (b) preferred method used by behavior experts, (c) lack of environmental control, and (d) ease of implementation. This study addressed the following research questions.

1. Can three to five early childhood education teachers, using a multiple baseline research design, independently identify the function of behavior and then select a function-matched intervention after training?

2. What is the correspondence between teacher scores and behavior expert scores as measured by pen and paper test probes?

3. Using a Likert scale questionnaire, what is the social validity of teacher training?

CHAPTER III

METHODS

Participants

Participants for this study were three female early childhood educators working in a public school district in the Western U.S. All participants taught children ages 3- to 5-years-old and completed a bachelor's degree in education. Rachel had taught the longest, with 15 years of experience, Eleanor had 11 years of experience and Sabrina had 1 year of experience. Rachel and Sabrina taught in special education setting and Eleanor taught in a regular education setting. All participants had five or more children on their caseload who had been identified by the school district as having a disability under IDEA. Participants in this study had limited to no prior experience or training on descriptive behavior assessment procedures or function based interventions. Participants received limited training or support on implementing ABA principles in the classroom prior to this study.

Prior to the study, a brief questionnaire was given to all early childhood education teachers employed by a local school district. The purpose of this questionnaire was to determine if participants qualified for the study. Questions asked the level of experience with descriptive FA procedures, willingness to participate in the study and level of interest in learning about (a) FBA procedures, (b) functions of behavior, and (c) evidence based interventions. Questions in this section were presented using a Likert Scale (*no interest, little interest, moderate interest, and high interest*). A moderate or high level of

interest qualified participants for this study. Participants were selected based on the following criteria: (a) willingness to participate in the study, (b) moderate to high interest in receiving training about behavior and evidence based interventions, and (c) met the experience criteria previously described. Those not meeting the above criteria and/or scoring above 60% in baseline were excluded from this study.

Informed consent was obtained from each participant. The form indicated: (a) that the study concerned identifying the function of behavior and selecting function-matched interventions for each function, (b) participation was voluntary and, (c) if they chose to participate, they could withdraw from the study at any time without any penalty. Those who completed the study were given a $100 gift card to a school supply store at the conclusion of the study.

Setting and Materials

Training and assessment of participants took place in a school district preschool classroom. The room was 4.9 m x 4.9 m and included child-sized furniture, shelves with toys and instructional materials, area rug, and other preschool teaching materials. Other items in the room included: overhead projector, pull-down white screen, computer and speakers. All training sessions and assessments were conducted individually with only the adult participant and researchers present. No students or nonstudy-related adults were present. The researcher was present to collect data, provide training instruction and feedback as needed.

Training materials included a PowerPoint presentation used with trainer's manual

and a participant guide created by Borgmeier et al. (2015). The researcher made minimal modifications: (1) modified the training examples and vignettes to reflect preschool age appropriate behavior examples, and (2) simplified terms from behavior analytic to common terms that would be more likely recognizable to participants (see Table 1). The researcher also added fictitious ABC Recording Form data sets with 10 forms per set, for teachers to analyze during and post-training. A panel of four BCBAs, with 3-4 years of experience and knowledge of the FBA process, reviewed the fictitious ABC data sets used during training and test probes. The purpose of this review panel was to review ABC data sets and determine if a clear function of behavior and function matched interventions could be identified. Only those sets that received at least three out of four of the exact same response on identifying the function and function matched interventions were used. If answers differ between panelists, or if no clear conclusion was made, those sets were not used.

Design and Dependent Measures

A multiple baseline probe across participants' design was used to evaluate the effects of a training package on teachers' ability to identify the function of behavior and select function-matched interventions. This experimental design was selected in order to compare and demonstrate learning across participants to minimize bias or possible effects from group training. Probes were conducted in baseline to minimize the impact on the teacher's time, and to reduce the possibility that repeated exposure to data sets might

Table 1

Changes, Substitutions, and Omissions from Borgmeier et al. (2015) Study

Original Study Borgmeier et al. (2015)	Changes, Substitutions, and/or Deletions
Throughout All Modules/Overall Changes	
1. Term contraindicated	1. Substituted term "Non-function based"
2. Only used Module 4 for training	2. Used Modules 1, 3, & 4 for training
Module 1	
3. Scenario 3.1: throws his pencil and rips his paper, double-digit math problems, getting sent to the office.	3. Scenario 3.1: throws objects off table, count 10 objects, getting sent to "thinking time" corner of the room.
4. Scenario 4.2: language arts, writes profane language on her assignments, to the office with a referral for being disrespectful	4. Scenario 4.2: speech group, uses profane language ~~on her assignments~~, another part of the room to be by herself ~~with a referral for being disrespectful~~ (and she misses the assignment).
5. Example 1: a fifth grade student	5. Example 1: a preschool student
6. Module 1 Task : to select a student at your school and use ABC tracking form to document 5 occurrences of behavior.	6. Module 1 Task was omitted
7. Setting Events training	7. Setting Events training was omitted
Module 2	
8. Module 3: Observing & Summarizing Behavior	8. Renamed to Module 2: Observing & Summarizing Behavior
9. term "FACTS Interview"	9. Substituted term "Summary statement"
10. 3 Task: Conduct ABC Observation using ABC recording form for 20-30 minutes.	10. Module Task was omitted
Module 3	
11. Module 4: Critical Features of Function-Based Behavior Support	11. Renamed to Module 3: Critical Features of Function-Based Behavior Support
12. Term "FACTS Interview"	12. Substituted term "Summary statement"
13. Example 1: Leslie is 12, Life Skills classroom	13. Example 1: Leslie is 5, in the preschool classroom
14. Example 2: Jason is nine	14. Example 2: Jason is four
15. Module 4 Task: complete the Competing Behavior Pathway & Behavior Support Planning Form to identify function-based interventions.	15. Module Task was omitted.
	16. Added LRBI reference and page numbers for intervention selection guide.

increase the participants' ability to interpret the data. Repeated measures were used following training to evaluate the effects of the training. The dependent variable in the training condition was the percentage of correct responses for determining function and selecting function matched intervention following training. Data were collected in the form of a paper test (see Figure 1) with between three to six measures during baseline, five to seven measures post-training, and a final measure at a maintenance check 2-3 weeks after training. The researcher was the primary data collector and conducted all assessment sessions.

Treatment Fidelity and Inter Observer Agreement

An independent evaluator checked the delivery of training by the researcher by completing a checklist (see Figure 2) that evaluated the following (a) trainer stated objective of training module, (b) trainer explained key points and ideas of each module, (c) trainer provided rationale for identifying function of behavior (d) trainer offered examples and assessed participant's responses and, (e) trainer provided practice and feedback to participants. One observation was completed with each participant for one of three modules. Observed modules were different across participants so that each module had a fidelity checklist completed by the end of all training sessions. Results of the treatment fidelity checklist was 100% for each observation of the three modules.

Inter observer agreement (IOA) was calculated on participants' responses for function identification and intervention identification separately, using 100% of the 12 scenarios for each participant, minus one for Rachel as the researcher was unable to

	Target Behavior	Demonstrated Behavior	Comments

Please read the hypothetical ABC data forms below. Based on the information provided, please write in the possible function of the behavior on the line provided. Next, indicate if you would rate the proposed intervention as a:

FB- Function-based intervention = an intervention that directly addresses the function of the problem behavior and is expected to improve behavior

NB- Non function-based intervention = an intervention that conflicts with the function of the problem behavior (i.e., provides access to maintaining consequence(s) following problem behavior) and may increase problem behavior.

Scenario 1

Jacob, a 5-year-old, attends preschool at Springfield Elementary. His preschool teacher describes him as disruptive and difficult to work with. After interviewing other classroom adults and conducting several observations of Jacob, his teacher determined that, particularly on days when an altercation with a peer has occurred and when asked to do work in small groups, Jacob makes inappropriate comments (e.g., "This is dumb!"), pushes materials off his desk, and refuses to do his work.

(ABC data sheets will accompany this info)

Based on the data collected, the function of Jacob's behavior is:

_____.

Based on the information provided in the scenario, the team is considering the following interventions. For each intervention, please indicate if you would rate it as a FB (function based) or NB (nonfunction based) in the spaces provided.

1. ____ Teach student to appropriately request a break.

2. ____ When problem behavior occurs, allow student to work alone.

3. ____ Develop a simple behavior contract with the student specifying that if he works successfully in small groups with peers for a specified time, he can spend the remainder of time working independently.

4. ____ When problem behavior occurs, send student to the hallway with adult to the complete activity.

5. ____ When presenting small group instruction on days when Jacob has had a previous peer altercation, provide a choice of working either individually or with a peer partner.

Adapted from Strickland-Cohen, M. K. (2011). *Educational Community Supports*, University of Oregon.

Figure 1. Example baseline and post-training evaluation probes.

Arrang. Environ.	Has Powerpoint ready		
	Participant guide given to participant		
General Training Procedures	Trainer explains objectives for the module		
	Information is given at a pace that participant is able to follow		
	Training is free of jargon or complex terms that may not be understood by participant.		
	Trainer provides examples/non-examples (as needed)		
	Trainer provides knowledge of content that is consistent with ABA research and practices		
	Trainer provides time for participant's questions		
	Trainer answers questions clearly		
	Trainer provides model of task		
	Trainer provides feedback on tasks		
	Trainer provides instruction for tasks/checks for understanding		
	Trainer provides time to complete tasks/checks for understanding		
	Check for understanding turned in to trainer and graded to determine if participant is able to move onto to next module.		
Module 1 Procedures	Trainer explains antecedent/behavior/ consequence		
	Trainer explains observable and measureable behavior		
	Trainer explains reinforcement and punishment		
	Trainer explains function of behavior or payoff		
Module 2 Procedures	Trainer explains and provides practice in creating summary statements		
	Trainer provides instruction on how to fill out ABC observation form		
	Trainer provides guidelines for conduction an observation		
	Trainer provides guided practice in filling out ABC observation form		
	Trainer provides independent practice in filling out ABC observation form		
	Trainer provides instruction on summarizing results of ABC observation form		
Module 3 Procedures	Trainer shows and explains what is a Competing Behavior Pathway.		
	Trainer provides instruction and practice opportunities for participants to use a Competing Behavior Pathway.		
	Trainer explains essential components of a behavior support plan.		
	Trainer provides instruction on use of replacement behaviors		
	Trainer provides instruction on reinforcement and prompting replacement behaviors		
	Trainer provides instruction on strategies to use to prevent problem behaviors		
	Trainer provides instruction on how to prompt positive behaviors		
	Trainer provides instruction on altering consequences		
	Trainer provides resources (i.e. LRBI and Function Matched Strategies) to participant on where to find/select strategies		

Figure 2. Training fidelity checklist.

locate the response sheet. An independent rater scored each data set. IOA was calculated by dividing the number of point-by-point agreements by point-by-point agreements plus point-by-point disagreements, multiplied by 100%. IOA for function identification for all participants was 100%. IOA for intervention identification for 12 scenarios for each participant was 100%.

Procedures

Pre-Experimental Procedures

A panel of four BCBAs used fictitious ABC data sets to identify the function of the behavior. Using that function, a list of possible interventions was given and experts were asked to determine if that intervention was function matched or contraindicated (i.e., addressed a different function). Scores from each data set were used for later comparison to participants' responses.

Baseline

Participants completed an adapted assessment from "Behavior Support Plan (BSP) Knowledge Assessment" (Borgmeier et al., 2015; see Figure 3) that assessed the participants' general knowledge of "Basic Components and Critical Features of BSPs" (Borgmeier et al., 2015) in an attempt to assess participants' basic knowledge prior to training. Participants then received a vignette with a corresponding set of fictitious ABC data with 10 occurrences of problem behavior and a list of possible interventions. Participants were asked to identify the function of the behavior between a choice of (a)

Name: _____

Behavior Support Plan Knowledge Assessment - Version A

1. What are the four critical components of Behavior Support Plans?

a.)_____

b.)_____

c.) _____

d.) _____

2. Please describe three elements that are incorrect or missing from the competing behavior pathway below:

a) _____

b) _____

c) _____

3. Preventive strategies are designed to eliminate or modify _____ that "trigger" problem behavior, and eliminate or neutralize the effects of any identified _____.

4. What are the two different types of consequence strategies that should be included as part of any behavior support plan?

1. _____

2. _____

Adapted from Borgmeier et al. (2015) & Strickland-Cohen, M. K. (2011). Educational and community supports, University of Oregon

Figure 3. Behavior support plan knowledge assessment.

attention (b) escape or (c) access to a tangible by analyzing the fictitious data set. The participants were then asked to rate each intervention as either Function Based (F) or Nonfunction Based (N) from a list of five interventions for each data set (see Figure 1). For the purpose of this study, the researcher used the term "nonfunction" based to replace the term "contraindicated" as used in the Borgmeier et al. (2015) study. To eliminate the possibility that participants could rule out functions because they had already been used, vignettes and data sets representing the different functions were presented in a semi random (using a random number generator) order. Each function had equal representation across the total number of probes. Participants' written responses were scored as correct or incorrect and converted into a percentage. Each component (e.g., function of behavior and identification of interventions) were scored separately, in order to evaluate participants' ability to identify each component. Any function identified incorrectly by participants resulted in that whole scenario and interventions being discarded and another scenario given to the participant. The researcher was the primary data collector and conducted all assessment sessions. No feedback or correction was given to participants during assessment sessions.

Training

Participants received individual training divided into three modules: (1) basic behavior principles (e.g. reinforcement and punishment), (2) identifying the function of behavior, and (3) identifying interventions as function-matched or contraindicated using training materials from Borgmeier et al. (2015). Trainings were delivered using a Behavior Skills Training (BST) model including: describing the concept or skill (verbally

and in writing), modeling, practicing, and providing feedback (Parsons, Rollyson, & Reid, 2012).

Each training module was delivered individually over three separate sessions lasting between 60-120 minutes using training a PowerPoint presentation, training materials, and the participant's guide from Borgmeier et al. (2015). Participants were encouraged to provide real life examples from the classroom during training to assist in the learning process. Following each module, participants were assessed to determine mastery before moving onto the next module. All participants were able to meet mastery criteria on the first attempt and additional coaching and practice was not needed. Although not needed, researcher planned for participants who did not meet mastery criteria would have received additional coaching and practice.

In Module 1, the training focused on providing background knowledge on basic behavior principles (e.g., reinforcement and punishment). Module 1 had the least amount of information and took the least amount of time with participants, Sabrina lasted 68 min., Eleanor lasted 75 min., and Rachel lasted 67 min. Following the completion of Module 1, participants took a 10-item fill in the blank assessment of basic behavior principles and needed to receive 90% or higher before moving on. Module 2 described collecting ABC data and hypothesizing the function of behavior (attention, escape and tangible) using hypothetical and teacher collected "ABC Recording Form" data from prerecorded videos provided by Borgmeier et al. (2015) training. This training module was the most difficult for all participants. The prerecorded videos from Borgmeier et al. were difficult for participants to record all incidences of problem behavior and the video needed to be

paused after every three occurrences for participants to catch up. Another difficulty for all participants was understanding and recording the instances where the consequence also became the antecedent for the next occurrence for problem behavior; even after being prompted by the researcher before the video started that there were occurrences that the consequence would become the antecedent for the occurrences of problem behavior. This module lasted 77 min. for Sabrina, 81 min. for Eleanor, and 83 min. for Rachel. Following the completion of Module 2, participants completed ABC data from prerecorded videos recorded by researcher and identified behavior function. To meet mastery criteria, participants were required to identify all three behavior functions with 100% accuracy. Module 3 provided guidance on selecting evidence-based function matched interventions with a replacement behavior for each of the three functions. This module took the longest to complete but had the most information. Participants completed this module in 96 min for Sabrina, 106 min for Eleanor, and 94 min for Rachel. Following completion of Module 3, participants received pre-made data sets with the function of behavior identified and five possible interventions for each behavior function. Participants were asked to select function-matched interventions and rate them as function based (F) or nonfunction based (N). Participants were required to correctly indicate four out of five of the total listed interventions for each behavior function. Participants received coaching and training from researcher throughout the training.

Post-Training Evaluations

Following completion of all three modules, participants completed an adapted assessment from “BSP Knowledge Assessment” (Borgmeier et al., 2015) as described in

baseline. This was completed only once and the scores were used to evaluate improvements in participants' knowledge of critical components in a behavior support plan after training. Conditions remained the same as in baseline, with no feedback or correction from the researcher. Participants received multiple vignettes with corresponding sets of fictitious ABC data and a list of possible interventions for each data set as described in baseline. Researcher used scores to evaluate improvements in scores following training, and to compare to the scores of the expert panel. Conditions remained the same as in baseline for all assessment periods.

Maintenance Check

A maintenance probe was conducted 2-3 weeks following completion of training. This evaluation occurred under the same conditions as the training evaluations.

Post-Experiment Social Validity Survey

At the conclusion of the study, participants were given a paper and pencil rating scale to rate perceptions of training. Participants' responses were measured using a Likert scale (see Table 2). Questions were adapted from the *Treatment Acceptability Rating Form-Revised* (TARF-R; Reimers et al., 1992).

Table 2

Social Validity Measure of Training

Item	Question	*M*	Range
1	I found the content of the modules easy to understand.	4.66	4 to 5
2	I found the modules provided useful information.	5.00	5 on all
3	I found that modules were too difficult to understand or hard to master.	1.66	1 to 2
4	The trainer gave clear expectations during training.	4.66	4 to 5
5	The trainer spoke clearly and was easy to understand.	5.00	5 on all
6	The trainer kept a good pace of instruction (not too fast or too slow)	4.33	3 to 5
7	The trainer provided enough opportunities for practice and/or to ask questions	4.66	4 to 5
8	I found the training manual helpful in learning the content in the modules	4.66	4 to 5
9	I found the PowerPoint presentation easy to understand	5.00	5 on all
10	I found this training valuable	5.00	5 on all
11	I found the time requirements to complete each module to be reasonable	4.33	3 to 5
12	I believe I can accurately identify function of behavior	3.33	3 to 4
13	I believe I can accurately identify function based interventions	3.66	3 to 4
14	What is the likelihood to use the ABC data form in the future?	3.66	3 to 4
15	What is the likelihood to use the Competing Behavior Pathway?	3.66	3 to 4
16	How likely are you to recommend this training to others?	4.33	4 to 5

Note. All items scored 1 (*definitely disagree*) to 5 (*definitely agree*).

CHAPTER IV

RESULTS

Training

Data demonstrated that all participants were able to identify the function of behavior with 100% accuracy during all baseline and post-training measures (see Figure 4) for each behavior function. Although all participants were able to identify each function of behavior, selection of function matched intervention data demonstrated a more variable trend and lower level of accuracy in baseline, with a higher level of accuracy post-training across participants (Figure 5). Data demonstrated that Sabrina correctly identified function match interventions a mid-level of 60% with a flat trend and zero variability in baseline measures. Eleanor also demonstrated a mid-level of correct responses starting at 60%, but with a decreasing trend to 40% across measures in baseline. Baseline data for Rachel was also at a mid-level of 60% with flat trend and no

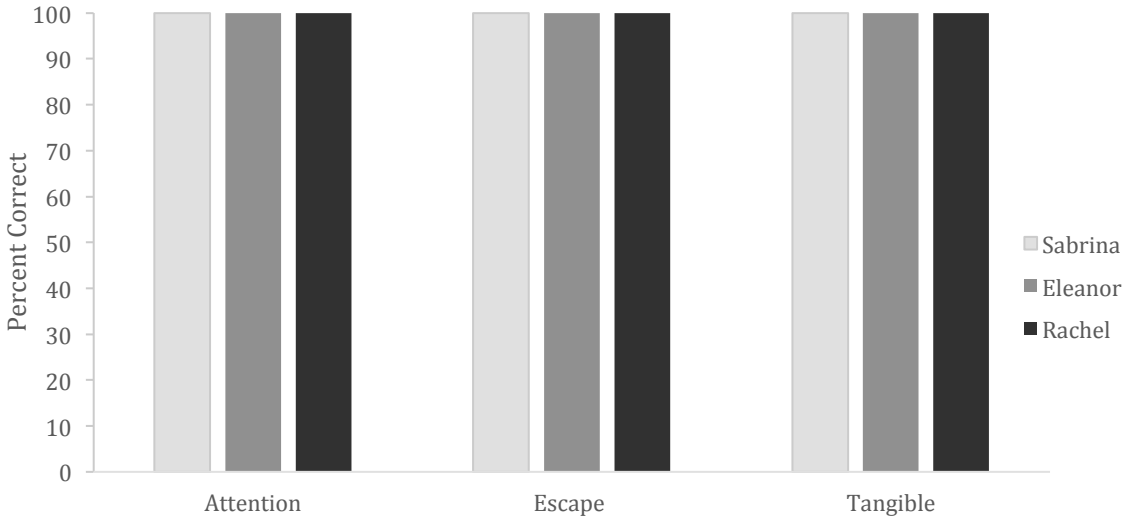

Figure 4. Participants' identification of behavior function.

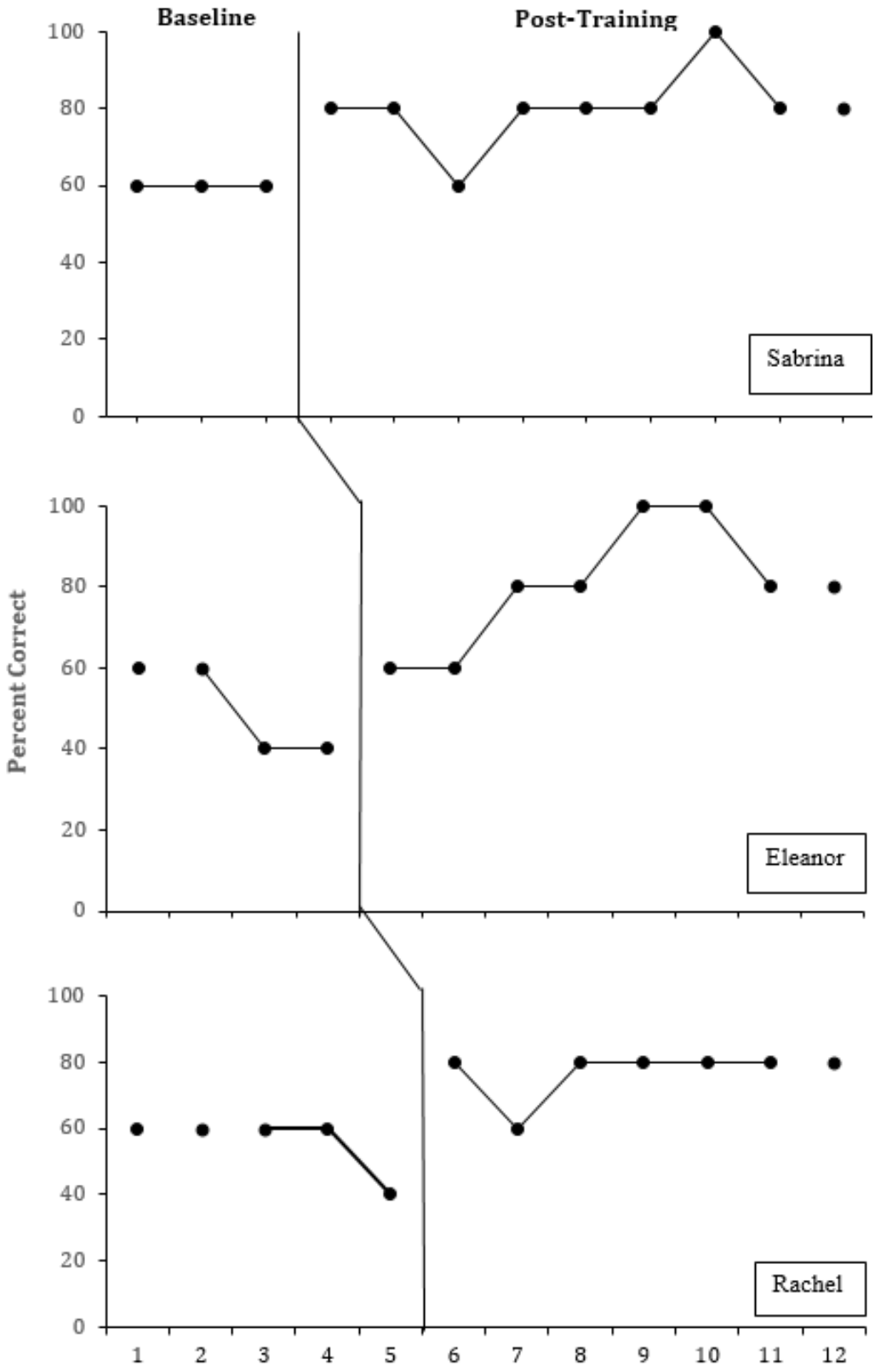

Figure 5. Participants' scores on rating of interventions.

variability until the last measure, which decreased to 40%. The effects of training and mastery of modules with participants produced an increase in level of correct responses from participants on assessment scores. Sabrina demonstrated accuracy of 60% in baseline. Post-training measures had slight variability across measures. Her overall level of correct responses increased over baseline to 80% in post-training measures with one measure at 60% and another at 100%. Eleanor demonstrated similar results. Her level also increased to 80% over baseline. Her data had an ascending trend with some variability across measures with a high of 100% on two measures and a low of 60% with an average of 80%. Post-training data for Rachel was similar to other participants' level of correct responses in that she also demonstrated an increase in post-training measures over baseline. Her scores remained stable with a flat trend at a level of 80% with slight variability in one measure that dropped to 60%. Unlike the other two participants, Rachel did not reach a level of 100% accuracy on any measures. No consistent errors patterns could be found across participants and across functions. Although inconsistent errors occurred, the Laroy scenario scored the highest across all participants, Eleanor and Sabrina both at 100% and Rachel at 80%. A secondary analysis of the correspondence between the participants' and experts' identified function and intervention selection of each data set demonstrated a lower correspondence with a range of 53-60% before training and higher correspondence of 67-93% after training (see Figure 6).

Post-Experiment Social Validity Survey

All participants indicated modules were easy to understand and provided useful

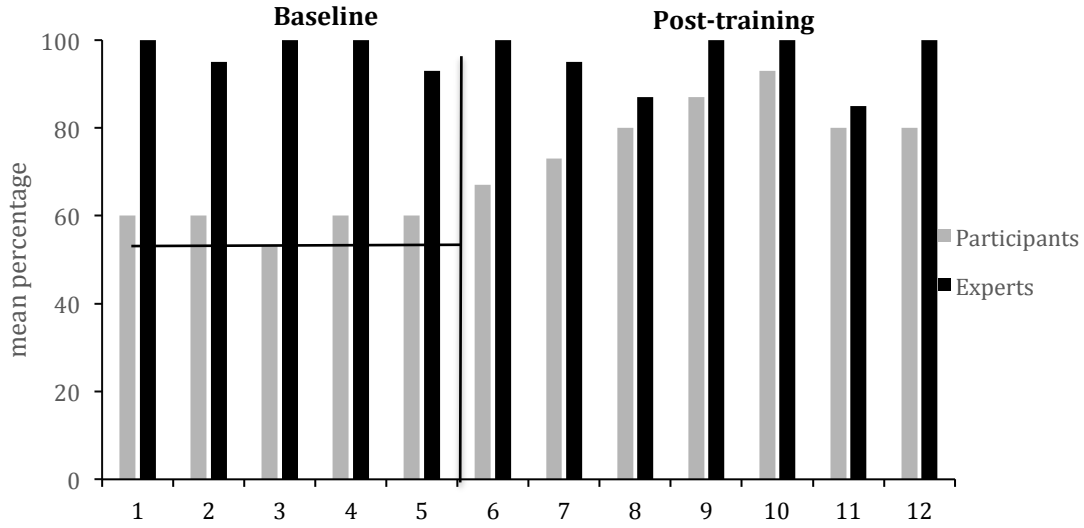

Figure 6. Comparison of intervention selection mean percentages.

information. When asked about the trainer's instruction, all participants indicated trainer gave clear expectations, spoke clearly and was easy to understand. All participants indicated that the trainer provided enough opportunities for practice or questions. Sabrina indicated pace of instruction was a little too fast and wrote that there was a lot of information to take in so quickly. Eleanor and Rachel indicated that they felt the pace was appropriate. When questioned about training materials, all participants agreed that the training manual was helpful in learning module content, and the PowerPoint presentation as easy to understand. Participants indicated that learner's experience overall was positive. Sabrina and Rachel indicated they would like some additional practice and feedback on identifying behavior function and function matched interventions. All participants reported that they found the training valuable and would recommend this training to others.

CHAPTER V

DISCUSSION

The results of this study suggest that with training and practice opportunities in evidence-based function matched interventions, the participants increased the accuracy of identifying function-matched interventions. All participants were able to identify function of behavior with 100% accuracy in baseline and across all post treatment measures. Interestingly, this did not predict accuracy performance with regard to identifying function-matched interventions. This disconnect might be influenced by a number of factors. First, the list of interventions may have been unclear or too vague to detect a clear correct answer without specific training. Second, the participants may have entered the study with skills that assisted in identifying the function of behavior from the descriptive data sets, but that were not beneficial in making the needed discriminations related to interventions. Third, it is possible that the participants were not familiar with some of the interventions described in the evaluations. Regardless of the reason that accurate identification of functions is not predictive of the ability to accurately identify function matched interventions, this may be important information for trainers and teacher-preparation programs. These data provide preliminary evidence that preservice teachers need training opportunities on identifying function-matched and contra-indicated interventions, along with learning how to identify the function of behavior.

Following training, all participants increased their accuracy of identifying function-matched, and nonfunction matched interventions. Similar results were found in past research demonstrating that classroom staff can be trained to identify function-

matched interventions with greater accuracy (Borgmeier et al., 2015; Loman & Horner, 2014). Results from the current study extend current research by demonstrating that early childhood educators can increase their accuracy of identifying function matched interventions for targeting problem behavior. Although all participants in this study demonstrated an increase in accurately selecting function matched interventions, 100% accuracy of function matched intervention selection was not consistently obtained across post-training measures. Future researchers may wish to evaluate other training methods, or enhance the training evaluated in this study with the goal of producing greater increases post-training.

One implication of these results is that teachers can be valuable assets to the behavior team when composing behavior plans for students in the classroom. Utilizing teacher's knowledge of (a) the student, (b) classroom culture, and (c) basic behavior principles, behavior plans have the potential to be more effective and implemented with more fidelity in the classroom. Another implication of these results is that by training teachers to understand functions of behavior and function-matched interventions, teachers may have more autonomy in the classroom to start basic interventions sooner rather than waiting for an expert's assessment and risk having the problem behavior worsen. Additionally, by increasing teachers' ability to identify function-matched treatments for problem behavior, interventions may not only start sooner, but also may be more appropriate; therefore, behaviors may not escalate or worsen over time due to unintentional reinforcement by teachers and other classroom staff.

One possible limitation to this study is that participants work for the same school

district and they may not be representative of the early childhood educator population. Future research may include participants from various school districts and/or other early childhood programs outside of the school district. Future research may include participants from various school districts and/or other early childhood programs outside of the school district. Another potential limitation is that for this study all training was done at the individual level and took about 1 to 1½ hours to deliver each module. This may not be a feasible option for those with limited time or resources available. Another possible limitation may be that providing participants with previously complied FBA data sets, rather than having participants conduct their own FBA during each assessment, may have affected a valuable learning component in understanding function of behavior. Future research may investigate the effect on teachers' ability to identify function of behavior based on precollected FBA data versus those that collect the FBA data themselves. A third possible limitation is the lack of an applied setting component. Having teachers select a student in his or her current classroom and developing function-matched interventions that they then implement and collect data on may provide a valuable learning component to understanding effects of function-matched interventions. Future research may extend to include the applied setting component and looking at effects of teacher selected interventions. Despite the need for continued research in this area, this study extends the current literature by demonstrating that preschool teachers can successfully identify function and non-function matched interventions in a training context.

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