ABSTRACT

The Use of Demand Assessments in the Assessment and Treatment of Challenging
Behavior

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Selection of demands without a demand assessment could result in a failure to identify an escape function for escape-maintained challenging behavior. Demands may be categorized into two categories: low-aversive and high-aversive demands. Low-aversive demands are demands associated with little or no challenging behavior and high-aversive demands are demands associated with frequent or high rates of challenging behavior. High-aversive demands identified in the demand assessment are typically used in the subsequent assessment and treatment of challenging behavior.

The Use of Demand Assessments in the Assessment and Treatment of Challenging Behavior

by

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

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CHAPTER ONE

Introduction

Applied Behavior Analysis

The scientific approach for identifying variables that influence socially significant

behavior is known as applied behavior analysis (ABA). ABA is the study of behavior,

this consists of direct observations of the relationships between environmental stimuli

and the responses they are associated with (Cooper & Heward, 2014). ABA is derived

from the foundation laid out by John Watson. Through his initial research and attempt to

guide the field of psychology, applied behavior analysis was developed into a systematic

science of behavior (Cooper et al., 2014). ABA involves improving socially significant

behavior by systematically altering environmental events.

ABA is categorized into seven dimensions, as laid out by Baer, Wolf, and Risley

(1968). The seven dimensions are applied, behavioral, analytic, technological,

conceptually systematic, effective, and generality. These dimensions set the groundwork

for applied practice and socially significant research. Applied means that the person

affected by ABA therapy is receiving important, socially significant treatment and the

behavior analyst demonstrates the social importance of the targeted outcome. Analytic

means that behavior analysts must be able to determine if the intervention was

responsible for the occurrence or non-occurrence of the target behavior through

manipulation of the independent variable. When an intervention is effective it means that

the interventions produce socially significant and important changes in the target

behavior (Baer et al., 1968). ABA is both applied and behavioral, meaning that target

outcomes for ABA interventions should be related to observable behaviors that are likely to improve the individual's life. Therefore, ABA interventions have often been used to reduce challenging behavior in children with developmental disabilities.

Functional Analysis

Previous research indicates that challenging behavior is affected by the history of consequences associated with that behavior and that challenging behavior servers to obtain and/or avoid consequences (Cooper et al., 2014). Therefore, it is important to find the function, or purpose, of challenging behavior in order to inform the intervention. Identifying the function of the challenging behavior is often done through a functional analysis. A functional analysis is an experimental method for identifying the function for challenging behavior (Iwata et al., 1994).

During a functional analysis, antecedents (i.e., the situation) and consequences (i.e., the response to challenging behavior) are systematically altered to evaluate their effect on challenging behavior. Functional analyses typically involve the assessment of access to attention, access to tangible items or activities, escape from academic demands, and automatic reinforcement as possible functions of challenging behavior. More challenging behavior in one of the test conditions (e.g., attention or demand) than the control condition (i.e., play condition) indicate the challenging behavior is associated with that function. Function-based treatments are then designed for the participant based on the functional analysis results. Past research has demonstrated that function-based treatments are more effective in reducing challenging behavior than non-function based treatments (Campbell et al., 2003; Heyvaert et al., 2004).

Demand Assessment

For each of the functional analysis conditions, the behavior analyst must pick specific items or environmental conditions to be included. For example, stimulus preference assessments are often conducted to determine the participant's most preferred toy for use in the tangible condition of the functional analysis (Iwata, Northup, & Kelley, 1994). Similarly, demand assessments can be used to identify in identifying demands that are associated with challenging behavior. In order to accurately identify the function of the challenging behavior, it is important to include tasks in the demand condition that may be associated with challenging behavior maintained by escape from demands (Roscoe, Rooker, Pence, & Longworth, 2009). Although it is common practice for implementers to conduct a stimulus preference assessment prior to a functional analysis, it is not common to conduct a demand assessment prior to a functional analysis (Call, Pabico, & Lomas, 2009). Selection of demands without a demand assessment could result in a failure to identify an escape function for challenging behavior in the demand condition, even if the behavior is maintained escape from demands (Kodak, Northup, & Kelley, 2007). Demand assessments result in the identification of demands associated with more challenging behavior, which informs the assessment and treatment of challenging behavior maintained by escape from demands. Demands may be categorized into two categories: low- aversive and high-aversive demands. Low-aversive demands are demands associated with little or no challenging behavior and high-aversive demands are demands associated with frequent or high rates of challenging behavior (Call, Pabico, & Lomas, 2009). High-aversive demands identified in the demand assessment are typically used in the subsequent assessment and treatment of challenging behavior. If

demands are selected for inclusion in the functional analysis without conducting a

demand assessment, the functional analysis may not produce accurate results. Due to the

importance of demand assessment, further examination of the literature related to demand

assessments is warrante

CHAPTER TWO

Review of Literature

The purpose of the literature review was to identify articles that conducted a demand assessment prior to or following a functional analysis.

Inclusion Criteria

Articles were included in this review based on the following two inclusion criteria: (a) the study included a functional analysis that indicated the participant engaged in escape-maintained challenging behavior and (b) the study included an observational data-based assessment to compare challenging behavior and/or compliance under different demand conditions (i.e., a demand assessment). If an article had some participants that met inclusion and some that did not, the participants who met the inclusion criteria were included in the literature review.

Search Procedures

A systematic search, consisting of a database and ancillary searches, were conducted. Education and psychology databases were searched in August 2017. Synonyms of functional analysis ("behavior assessment," function, *or* analysis), demand assessment ("demand evaluation," *or* "demand assess*"), and escape from demands (escape, "negative reinforcement," *or* "negatively reinforced") were used to identify articles in the following databases: Educational Resources Information Clearinghouse (ERIC), Academic Search Complete, Education Research Complete, PsyArticles,

PsycINFO, and Behavioral Science Collection. After removing duplicates, the search terms resulted in 58 unique articles.

The 58 articles identified in the database search were evaluated based on the inclusion criteria. The abstract and titles of the articles were first reviewed, and articles were kept for further review based on inclusion criteria. Of the 58 articles identified in the database search, 55 were excluded based on the title and abstract. The full text of the remaining three articles was reviewed and each of the articles met the inclusion criteria. Additional searches were conducted to identify articles not found by the initial search by (a) reviewing the journal with the most included articles, which was the *Journal of Applied Behavior Analysis (*JABA*)*, and (b) reviewing the reference lists of the three included articles. All JABA issues were reviewed based on the same inclusion criteria used in the database search; no additional articles were added to the literature review from the journal search. The reference list of the three included articles were reviewed based on the inclusion criteria above. Two additional articles were identified through the reference list search. Overall, two additional articles were identified for inclusion through the ancillary searches, for a total of five studies.

Data Extraction

Raters recorded information from each study regarding participant characteristics, study characteristics, demand assessment characteristics, and study outcomes. Participant characteristics included (a) age, (b) gender, and (c) diagnosis. The study characteristics included the (a) setting, (b) implementer, (c) and the topography of challenging behavior as demonstrated in Table 2.1 The primary topography was defined as the first topography listed in the article or the topography listed as primary. The demand assessment

characteristics included (a) dependent variable recorded during the demand assessment, (b) type of functional behavior assessment (FBA) conducted which included: indirect interview, direct observation, or a functional analysis. The indirect interview was conducted in order to identify possible target behaviors, the participant's eligibility for participation, possible negative reinforcers, and preferences; direct observations was defined as the caregiver, teacher, or experimenters directly observing the participants in clinical or naturalistic settings; the functional analysis was defined as observation of challenging behavior under different conditions that were actively manipulated by the experimenter (Iwata et al., 1994). Furthermore, the demand assessment characteristics also included (a) the number of demands assessed during the demand assessment, (b) the method of selecting demands for the demand assessment, (c) the number and length of sessions that were conducted during the demand assessment, (d) the implementer reaction to challenging behavior during the demand assessment, (e) and the order of FBA and demand assessment. The study outcome included whether the low-aversive and/or high-aversive demands identified during the demand assessment were associated with challenging behavior during the functional analysis as demonstrated in Table 2.2.

Table 2.1 *Child participants, Diagnosis, Setting, Implementer, Topography of challenging behavior*

Citation	Child Participants	Diagnosis	Setting	Implementer	Topography of Challenging Behavior
Call et al. (2009)	One 6-years-old male, one 14-years-old female	Autism, Cerebral Palsy	Day therapy facility	Therapist	Aggression, SIB, and disruptive behavior
Call et al. (2016)	One 6-year-old male, two 8-year-old males, one 9-year-old male, one 9-year-old female, four 10-year-old males, one 11-year-old male, two 14-year-olds, one 15-year-old male, one 15-year-old female, one 18-year-old male, one 21-year-old female	Autism, attention deficit hyperactive disorder, disruptive behavior disorder, global developmental delay, pervasive developmental disorder-not otherwise specified	Residential treatment setting	Therapist	Aggression, SIB, disruptive behavior, elopement, vomiting, and screaming
Roscoe et al. (2009)	Two 10-year-old females, one 14-year-old male, one 22-year-old male	Autism, intellectual disability, Smith Magenis syndrome	Residential treatment setting	Therapist	Aggression and property destruction

(continued)

8

Citation	Child Participants	Diagnosis	Setting	Implementer	Topography of Challenging Behavior
Schmidt et al. (2014)	One 14-year-old male	pervasive developmental disorder-not otherwise specified, intellectual disability, Mood Disorder-not otherwise specified, disruptive behavior disorder-not otherwise specified, attention deficit hyperactive disorder	Residential treatment setting	Experimenter	Aggression and property destruction
Zarcone et al. (1999)	One 8-year-old female	operational defiant disorder, Down Syndrome	Residential treatment setting	Therapist	Aggression, elopement, and disruptive behavior

Table 2.2 *How the demands were chosen, Reaction to challenging behavior during demand assessment, Demand assessment dependent variable, Escape function in high-probability demands during the demand assessment*

Citation	How the Demands were chosen	Demand Assessment Methods	Reaction to Challenging Behavior During Demand Assessment	Demand Assessment Dependent Variable	Escape Function in Low-aversive and High-aversive Demands During the Demand Assessment
Call et al. (2009)	Through an indirect assessment the demands were chosen by the caregiver completing the NRRS	Direct observation	Demand materials removed, and session ended	Mean latency to first instance of challenging behavior	Escape maintained challenging behavior observed in both the high-aversive and low-aversive demand condition
Call et al. (2016)	Through an indirect assessment the demands were chosen by the caregiver completing the NRRS	Direct observation	Session ended, and next session began immediately	Latency to first instance of challenging behavior	Only the high-aversive demand condition results in escape maintained challenging behavior
Roscoe et al. (2009)	Demands were chosen from the participants IEPs	Escape condition of a functional analysis to assess the demands used	All items removed, and participants were given a 30s break	Level of compliance compared to frequency of instances of challenging behavior	Only the high-aversive demand condition results in escape maintained challenging behavior

(continued)

10

Citation	How the Demands were chosen	Demand Assessment Methods	Reaction to Challenging Behavior During Demand Assessment	Demand Assessment Dependent Variable	Escape Function in Low-aversive and High-aversive Demands During the Demand Assessment
Schmidt et al. (2014)	The article did not state how the demands were chosen for the demand assessment	Direct observation	All items removed, and participant was given a 30s break	Latency to first instance of challenging behavior	Only the high-aversive demand condition results in escape maintained challenging behavior
Zarcone et al. (1999)	Through an indirect assessment the demands were chosen by the caregiver completing the NRRS	Direct observation	All items removed, and participant was given a 30s break	Frequency of challenging behavior	Only the high-aversive demand condition results in escape maintained challenging behavior

Results

From the database and ancillary searches five studies were found that met the inclusion criteria (Call, Pabico, & Lomas, 2009; Call et al., 2016; Roscoe, Rooker, Pence, &Longworth, 2009; Schmidt et al., 2014; Zarcone, Crosland, Fisher, Worsdell, & Herman, 1999). Table A.1 and A.2 summarize the five studies that were analyzed in this review.

Participant Characteristics

Age, gender and diagnosis. Across five studies, there were 20 participants. The study by Zarcone et al. (1999), included five participants, but an FBA was conducted for only one of those five participants; therefore, only one participant was included in this literature review. Thirteen of the 20 participants were male (55%) and seven were female (35%). Twelve participants were between the ages of 6-12 years old; six participants were between the ages 13 and 18 years old; finally, one participant was 21 years old and one was 22 years old. Twelve participants were diagnosed with autism (60%), one participant was diagnosed with pervasive developmental disorder-not otherwise specified (PDD-NOS; 5%), one participant was diagnosed with an intellectual disability (5%), one participant was diagnosed with Smith-Magenis syndrome (5%), one participant was diagnosed with global developmental delay (5%), and one participant was diagnosed with cerebral palsy (5%). One participant was diagnosed with PDD- NOS, intellectual disability, mood disorder, attention deficit hyperactivity disorder (ADHD), and disruptive behavior disorder-not otherwise specified (5%). Another participant was diagnosed with ADHD and disruptive behavior disorder (5%). Finally, one participant was diagnosed with oppositional defiant disorder (ODD) and Down syndrome (5%).

Study Characteristics

Setting. Most of the studies (4 studies; 80%), were conducted in a residential treatment facility and the remaining study (20%) was conducted in a day treatment program.

Implementer. A therapist implemented the intervention in four of the studies (80%) and an experimenter implemented the intervention in the remaining study (20%).

Topography of challenging behavior. Of the 20 participants, 95% ($n = 19$) engaged in aggression. The remaining participant (5%), engaged in self-injurious behavior (SIB).

Demand Assessment Characteristics

Demand assessment dependent variable. For four studies (80%) latency to challenging behavior was selected as the dependent variable in the demand assessment. For one study (20%) the dependent variable was the rate per minute of challenging behavior.

Type of FBA. For each of the participants, a functional analysis was conducted to determine the function of the target behavior. Other than interviews used to identify demands, none of the five included studies reported conducting interviews or direct observations as part of the FBA.

Number of demands assessed. In two studies (40%), the demand assessment

included 10 demands. In one study (20%), 12 demands were assessed. In another study 6

demands (1 study; 20%) were assessed. In the last study, 8 demands (20%) were

assessed.

Indirect method for choosing demands. In three of the studies (60%), the

implementer chose the demands for the demand assessment through a brief parent

questionnaire. In one study (20%), the implementer chose the demands by using tasks

identified from the participants' Individualized Education Plans (IEPs). The final study

(20%) did not report how they chose the demands that were presented in the demand

assessment.

Demand assessment methods. In four of the studies (80%), the implementers

assessed the demands through direct observations prior to the functional analysis. In one

study (20%), the challenging behavior during the hypothesized high- and low-aversive

demands was assessed in two different escape conditions of the functional analysis.

Number and length of demand assessment trials or sessions conducted. In two

studies (40%), the implementer conducted thirty 10-minute trials, with each of the 10

demands presented three times. In one study (20%), the implementer conducted twenty-

four 5-minute trials, with each of the 12 demands presented two times. In another study

(20%), the implementer conducted eleven 10-minute trials, with each of 10 demands

presented one time. In the final study (20%), the implementer conducted six 10-minute

trials, with one trial per demand.

Reaction to challenging behavior during demand assessment. In three of the studies (60%), the implementer provided a 30 s break contingent upon challenging behavior. In one of the studies (20%), the implementer ended the session and began the next session immediately, contingent upon challenging behavior. In the final study (20%), the implementer removed the demand materials and the session ended contingent upon challenging behavior, but the length of the break was not specified.

Order of FBA and demand assessment. In three of the studies (60%), demands were assessed before the functional analysis was conducted. In one study (20%) demands were assessed during the functional analysis. The remaining study did not report the order of the demand assessment and the functional analysis.

CHAPTER THREE

Methods

Purpose

The purpose of the present study was to evaluate the extent to which immediate

help decreased challenging behavior associated with high-aversive, low-accuracy

demands. Specific research questions include:

(a) Are low-accuracy demands associated with a shorter latency to engage in challenging

behavior during the demand assessment compared to high-accuracy demands?

(b) For high-aversive, low-accuracy demands, does immediate help result in a decrease in

challenging behavior compared to high-aversive, low-accuracy demands without

immediate help?

(c) Does an intervention that involves teaching the participant to request help result in a

decrease in challenging behavior compared to baseline?

Participants

Inclusion Criteria

Participants were recruited for this study from a university-affiliated ABA clinic.

Informed consent was obtained from a parent prior to beginning any study procedures for

all participants.

Jones (pseudonym) was a three-year old Caucasian male, diagnosed with ASD by

a developmental pediatrician at 2 years old. Jones communicated vocally using one-to

two-word phrases (e.g., "help," "iPad"). In ABA therapy, Jones's goals included working

16

on increasing his manding repertoire based on Level One of the Verbal Behavior Milestone Assessment and Placement Program (VB-MAPP; Sundberg, 2008). The challenging behavior that he engaged in was crying and head banging. Due to the nature of Jones's challenging behavior, additional safety procedures were developed. The implementer attempted to block all instances of head banging. The implementer terminated the session if Jones engaged in three unblocked instances of head banging during the session. No sessions needed to be terminated during the study.

Archie (pseudonym) was a seven-year old African American male, diagnosed with ASD and a developmental delay by a developmental pediatrician at the age of three. Archie communicated using one-word utterances (e.g., "bye," "iPad"). In ABA therapy, Archie's goals included increasing his manding repertoire based on Level One of the VB-MAPP (Sundberg, 2008). Archie's target challenging behavior was aggression.

Setting

The research sessions took place at a university-affiliated ABA clinic called Baylor Center for Assessment Research and Education (CARE), which is a part of Baylor Center for Developmental Disabilities (BCDD). Sessions occurred in a room typically used for one-on-one instruction. During the sessions, the participants sat in a chair or on the carpet, facing the primary implementer.

Materials

Materials included academic demand materials (e.g., matching cards, match manipulators, puzzles, blocks, and cars), toys (e.g., violin, singing Elmo®, ball, and minions), and data collection materials (e.g., pen, paper, timers, and iPad®). The token boards were laminated and constructed from white printer paper. Ten Velcro® squares

17

were placed on the printer paper. Tokens were small, laminated, squares with sports balls on them and had Velcro® on the back, which allowed for the implementer to place each token on the board after it was earned.

<div align="center">*Data Collection*</div>

Dependent Variables

Data were collected on challenging behavior, task accuracy, and communication. The implementer collected data on latency to challenging behavior during the demand assessment for both participants. Latency was defined as the time between the initial demand and the first instance of challenging behavior. During the demand assessment, the implementer recorded latency using a timer, paper, and a pen. The research also collected task accuracy data during the demand assessment and treatment evaluation. Task accuracy was defined as independently and correctly completing a task. The percentage of task accuracy was calculated by dividing the number of demands completed independently by the overall number of demands presented and multiplying that by 100. Furthermore, the implementer collected communication data during the treatment evaluation. Communication was defined as an independent, specific request for help. During the treatment evaluation, the implementer recorded communication by recording the prompt needed to communicate during the sessions for each opportunity.

For Jones crying was defined as any occurrence of vocalization above normal conversational level, with or without tears. Head banging was defined as the participant moving his head and making direct contact with stationary object, person, or floor. The research collected data on percent intervals with crying during the modified functional

analysis and treatment evaluation. Partial interval recording was defined as the occurrence or nonoccurrence of challenging behavior during the 10 s interval for a 5-minute session. During the modified functional analysis and treatment evaluation, the implementer recorded partial interval recording by using a pen and paper method and marked a plus or minus in the appropriate location if the target challenging behavior occurred or did not occur during that interval.

For Archie aggression was defined as any occurrence of hitting a person, kicking a person or wall, scratching a person, and/or pulling on a person's clothing. The implementer collected data using rate per minute for the 5-minute session during both the modified functional analysis and treatment evaluation. A tally was recorded on the data sheet and the total number of tallies was divided by 5 to get a rate per minute.

Interobserver Agreement (IOA)

In order to ensure the reliability of each independent data collectors' measurement during observation, two independent observers collected data during a portion of the sessions. During the demand assessment the implementers collected total agreement IOA data for both Jones and Archie. This was calculated by dividing the shorter time by the longer time and multiplying that by 100 to get a percentage. For Jones's demand assessment IOA data were recorded for 30% of the sessions with an average agreement of 99% (range 98 to 100%). During the modified functional analysis, the implementer collected interval agreement IOA data for Jones. This was calculated by taking the number of agreements and dividing that by the sum by the number of agreements plus disagreements and multiplying that answer by 100 to get a percentage. For Jones's modified functional analysis IOA data were recorded for 37% of the sessions with an

19

average agreement of 98% (range 93 to 100%). During the treatment evaluation, the implementer collected interval agreement IOA data for Jones. For Jones's treatment evaluation IOA data were recorded for 34% of the sessions with an average agreement of 98% (range 93 to 100%). For Archie's demand assessment IOA data were recorded during 30% of the sessions with an average agreement of 97% (range 96 to 100%). During the modified functional analysis, the research collected total agreement IOA data for Archie. For Archie's modified functional analysis IOA data were recorded for 30% of the sessions with an average agreement of 98% (range 90 to 100%). For Archie during the treatment evaluation total agreement IOA data were recorded. This was calculated by dividing the shorter number by the larger number and multiplying that by 100 to get a percentage. For Archie's treatment evaluation IOA data were recorded for 30% of the sessions with 100% agreement for all sessions.

Experimental Design

The study consisted of a demand assessment, modified functional analysis, and treatment evaluation. A multielement design was used during the demand assessment to assess the latency to challenging behavior and task accuracy for each of the four task demands. A multielement design was also used for the modified functional analysis to compare the participant's challenging behavior during each condition. A reversal design was utilized for the treatment evaluation to compare the baseline conditions to the intervention conditions in order to evaluate whether there was a functional relation between the independent variable and dependent variable. During the treatment evaluation the independent variable was the functional communication training (FCT) intervention and the dependent variable was challenging behavior. For the modified

functional analysis there was 24 sessions for Jones and 20 for Archie. There were more sessions for Jones because there needed to be a stable trend before moving onto the treatment evaluation. During the treatment evaluation, each condition was at least five sessions and stable for the last three consecutive sessions before moving onto the next phase.

Procedures

   Parent or caregiver interview. A parent or caregiver interview was conducted using the Negative Reinforcement Rating Scale (NRRS; Zarcone et al., 1999; Crosland, Fisher, Worsdell, & Herman, 1999) and the Functional Assessment Interview (O'Neill et al., 1997; FAI). Based on the results of the parent interview the target topographies of challenging behavior were identified. The NRRS is a questionnaire given to the parent or caregiver of the participant that is used to identify which demands are associated with challenging behavior. The NRRS categorizes different domains of demands (e.g., academic, daily living) and from those domains the parents will identify demands that may result in challenging behavior. The parents or caregivers rank each demand on a Likert-scale. The NRRS was used to identify four demands to use during the demand assessment for both participants.

   Preference Assessment. For Jones, a free operant preference assessment was conducted. Five items were placed on a table in an individual therapy room. Jones had free access to all items. The implementers recorded the number of times each item was picked up and whether or not the participant engaged with the item and for x-amount of time the participant engaged with the item. For Archie a multiple stimulus without

21

replacement (MSWO) preference assessment was conducted based on the procedures

outlined by DeLeon and Iwata (1996). Each session began with the participant sitting

across the implementer at a table. All items were sequenced evenly in a straight line in

front of the participant and implementer. The implementer said to the participant "pick

one." Once the participant picked an item all other items were blocked, and the

participant had 20 s of access to that item before the implementer removed the item from

the array. Prior to the next trial, the items were rotated by taking the item on the left end

of the line and moving it to the right end. This procedure continued until each item has

been selected. If the implementer said, "pick one" and after 30 s no item had been

selected then the preference assessment would end immediately. The implementer

recorded the order of the items selected. The implementer repeated these procedures two

more times until three different preference assessments with the same materials has been

conducted. The implementer averaged the order of the items selected; the item selected

first, on average, was considered highly preferred and the item selected last, on average,

was considered least preferred.

Demand assessment. The demand assessment included four demands that were

selected based on the indirect NRRS assessment from the parent interview. Three trials

were conducted for each of the four demands, for a total of twelve trials. Each trial could

last up to five minutes but ended immediately after the first instance of challenging

behavior. The order of demands was determined by random selection within each set of

four prior to the beginning of the session. The participants were seated at a table with the

demand materials present in front of them and the implementer was sitting on the other

side of the table. During the 5-minute trials, the latency to the first instance of challenging

22

behavior was recorded for each demand as well as percentage of tasks completed independently and accurately for each demand. The implementer graphed the average latency and average percent accuracy for each demand (see *Figures A.1* and *A.4*). The sessions started with the implementer saying, "It's time to do work." Three step least-to-most prompting procedure were used to complete each trial, with a 5 s delay between prompts. Demand compliance resulted in mild descriptive praise and another trial began after a 5 s inter-trial interval for the duration of the session. If the demand resulted in challenging behavior, the demand materials were removed, and the session ended immediately. If no challenging behavior occurred, then the latency to challenging behavior was recorded as the duration of the session (i.e., 300 s). Demands were ranked in order of average latency to the first instance of challenging behavior. Demands with the shortest latency were ranked as high-aversive demands and demands with the longest latency were ranked as low-aversive demands. Demands with low latencies (shorter than 150 s on average) and low-accuracy (less than 50% independent and accurate responding) were included in the study as high-aversive, low-accuracy demands. If multiple demands met this criterion the demands with the shortest latency and lowest percent accuracy were chosen to use in the modified functional analysis and treatment evaluation. If two or more demands met that criteria, then both were used in the modified functional analysis and treatment evaluation. Demands with a latency of 150 s or longer on average and with an average percent accuracy of 50% or higher was used as a low-aversive, high-accuracy demand in the modified functional analysis. If no demands met this criterion then a low-aversive, high-accuracy demand condition was not conducted in the modified functional analysis.

Modified functional analysis. The modified functional analysis consisted of a

Control condition, a low-aversive demand condition, a high-aversive demand condition,

and a high- aversive, immediate help condition. The order of the conditions was

randomized within each set of four.

Control condition. The purpose of the control condition was to compare the rates

or intervals of challenging behavior to the low-aversive, high-aversive, and high-aversive

immediate help conditions in order to see an increase or decrease in challenging behavior,

to identify the function of the challenging behavior. During the control condition,

preferred activities were available to the participants and attention was provided at least

every 10 s, or when the participant initiates interaction. Target and non-target challenging

behavior was ignored during the entire session.

High-aversive demand condition. The purpose of the high-aversive demand

condition was to assess whether the function of the challenging behavior was maintained

by a break from demands that are categorized as high-aversive, low-accuracy demands

from the demand assessment. Demand materials were present, and the implementer said,

"it's time to do work" and presented high-aversive demands. A 30 s break from task

demands were provided contingent upon challenging behavior. Least-to-most prompting

was used contingent upon inaccurate responding or noncompliance, with a 5 s time delay

between prompts. Least-to-most prompting procedures start with a verbal prompt (i.e.,

stating the discriminative stimulus (S^D) for the demand), then verbal plus a model (i.e.,

stating the S^D and showing the participant how to complete the demand), and then a full

physical prompt (i.e., using hand over hand to guide the participant through completion

of the demand and stating the S^D). Contingent upon independent and accurate responding

there was a 15 s delay between the presentation of a new demand in order the control for the number of demands presented across conditions. There were 15 s between the presentation of each new demand.

Low-aversive demand condition. During the low-aversive demand condition, the implementer placed demands identified as low-aversive from the demand assessment. All other procedures were the same as the high-aversive demand condition. There were 15 s between the presentation of each new demand

High-aversive, immediate help demand condition. During this condition, demand materials were present, and the implementer said, "it's time to do work" and presented high-aversive demands. The implementer immediately provided the highest-level prompt (i.e., hand over hand guidance) to complete the demand using a 0 s time delay. A 30 s break from demands was provided contingent upon challenging behavior. There were 15 s between the presentation of each new demand.

Treatment evaluation. The treatment evaluation consisted of four phases: baseline, FCT, baseline, and FCT. Each phase consisted of at least five 5- minute sessions.

Baseline. During the baseline phase, high-aversive demands were presented using a least-to-most prompting hierarchy and the participant received a 30 s break contingent upon challenging behavior. In addition, during baseline the participant received a token following the prompted or unprompted completion of a demand. Contingent upon receiving of 10 tokens, the participant received a 30 enriched break from task demands.

25

FCT. During the intervention, the functional communicative response "help" was taught based on the results of the modified functional analysis. The implementer sat across the table from the participant and demand materials were present. The implementer said, "It's time to do work, if you need help say, 'help' and I will help you" at the beginning of each sessions. The implementer then immediately presented the same type of demands that were included in the baseline conditions. Using a 0 s time delay the implementer provided the highest level of prompt for the communication response (i.e., full physical) of "help." Demands were presented at least every 15 s. Contingent upon communication the implementer used the highest prompt level needed for task completion. If the participant engaged in challenging behavior, the experimenter waited for a 3 s break in challenging behavior before providing the highest level of prompt communication. The participant had the same token board as in the baseline condition and contingent upon the completion of 10 demands (prompted or unprompted) the participant received a 30 s break from task demands.

Baseline. The procedures in the second baseline phase were the same as the first baseline condition.

FCT. The procedures for the second functional communication phase were the same as the first FCT phase.

Treatment Fidelity

The treatment fidelity sheet included a step-by-step checklist of intended treatment implementation for each condition. The second observer used a checklist to evaluate the experimenters' accuracy in implementing the procedures. The treatment

fidelity was calculated by dividing the total number of steps implemented correctly by the total number of steps in the session and then multiplying that by 100. During Jones's demand assessment, treatment fidelity data were taken for 50% of the sessions with 100% fidelity. During Jones's modified functional analysis, treatment fidelity data were taken for 50% of the sessions with 100% fidelity. For Jones's treatment evaluation, treatment fidelity data were taken for 76% of sessions with 100% fidelity. During Archie's demand assessment treatment fidelity were taken for 50% of sessions with 100% fidelity. For Archie's modified functional analysis treatment fidelity data were taken for 50% of sessions with 100% fidelity. During Archie's treatment evaluation treatment fidelity data were taken for 62% of sessions with 100% fidelity.

CHAPTER FOUR

Results

Demand Assessment Results

The demand assessment resulted in the identification of a low-accuracy, high-aversive demand for both participants. Both participants were presented with four different task demand categories including: listener responding demands, matching demands, play demands, and gross motor imitation demands.

Jones

For the listener responding task, Jones's average latency to challenging behavior was 10 s (range 1 to 28 s) and his average percent accuracy was 25% (range 0 to 75%). For the matching task, his average latency to challenging behavior was 44 s (range 1 to 128 s) and his average percent accuracy was 6% (range 0 to 20%). For the motor imitation task, his average latency to challenging behavior was 35 s (range 8 to 54 s) and his average percent accuracy was 27% (range 0 to 66%). For the play task, Jones's average latency to challenging behavior was 37 s (range 3 to 87 s). On this task his average percent accuracy was 29% (range 0 to 87%). Based on the demands assessment results Jones did not have a low-aversive, high-accuracy demand as seen in Figure 4.1. Gross motor imitation and listener responding were both categorized as high-aversive, low-accuracy demands for Jones, therefore; these two demand categories were included in the modified functional analysis.
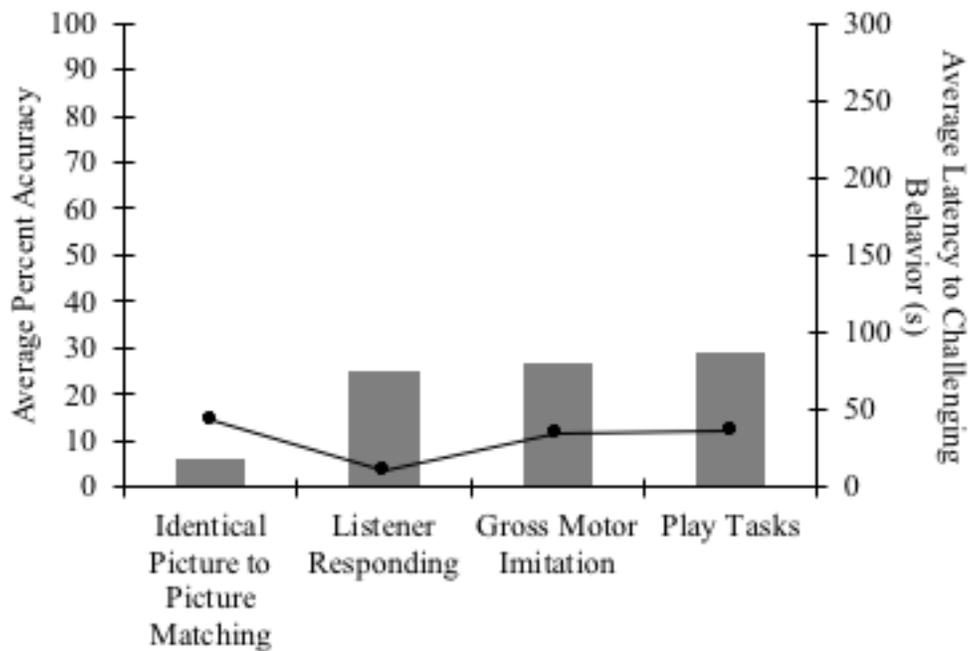
Figure 4.1. Jones's mean demand assessment results. Average percent accuracy is represented by the bar graph and average latency to challenging behavior is represented by the line graph.

Archie

For the listener responding task, Archie's average latency to challenging was 129 s (range 64 to 205 s) and his average percent accuracy was 40% (range 33 to 50%). For the matching task, his average latency to challenging behavior was 124 s (range 85 to 167 s) and his average percent accuracy was 18% (range 16 to 20%). For the gross motor imitation task, Archie's average latency to challenging behavior was 90 s (range 60 to 135 s) and his average percent accuracy was 40% (range 20 to 60%). For the play task, his average latency to challenging behavior was 244 s (range 209 to 300 s) and his average percent accuracy was 82% (range 80to 87%). Based on these results Archie's low-aversive, high-accuracy demand was play tasks and his high-aversive, low-accuracy demand was matching tasks as seen in Figure 4.2 .
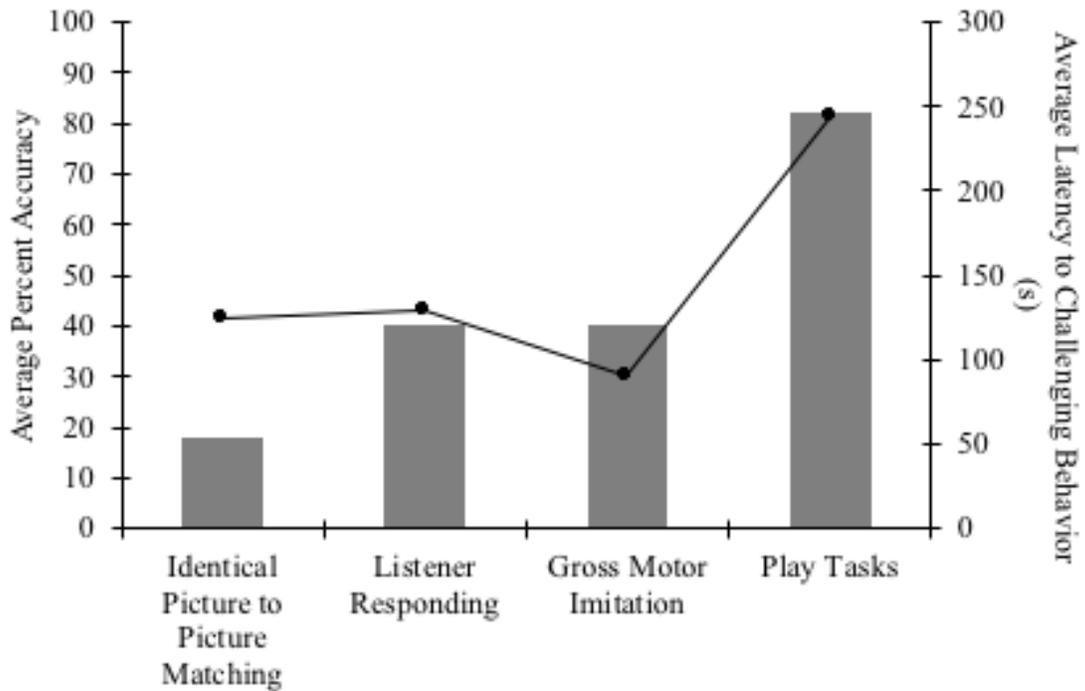
29

Figure 4.2. Archie's mean demand assessment results. Average percent accuracy is represented by the bar graph and average latency to challenging behavior is represented by the line graph.

Modified Functional Analysis Results

The modified functional analysis results indicated that providing immediate help for task completion using a full physical prompt acted as an abolishing operation for both participants (see *Figure A.2* and *A.5*). The functional analysis included a control, high-aversive, and high-aversive immediate help condition for both participants. Archie had an additional low-aversive, high-accuracy demand condition. Jones did not have a low-aversive, high-accuracy demand condition because each demand met the criterion for high-aversive during the demand assessment (i.e., latency to challenging behavior was less than 150 s).

Jones

Jones engaged in more challenging behavior in the high-aversive demand condition ($M = 21\%$, range 6 to 50%) as compared to the high-aversive immediate help demand condition ($M = 10\%$, range 0 to 26%). He also engaged in low rates of challenging behavior in the control condition ($M = 3\%$, range 0 to 13%) of intervals with challenging behavior as seen in Figure 4.3.
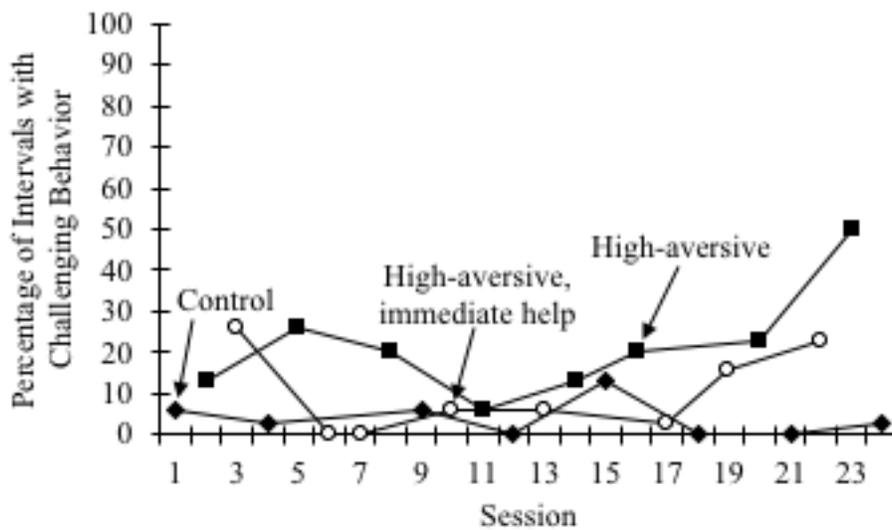

Figure 4.3. Jones's modified functional analysis results.

Archie

Archie engaged in more challenging behavior in the high-aversive demand condition ($M = 1.36$ responses per minute (RPM), range 0.4 to 2.0), as compared to the high-aversive immediate help demand condition ($M = 0.64$ RPM, range 0 to 1.4) and the low-aversive demand condition ($M = 0.36$ RPM, range 0 to 1.2). Archie did not engage in challenging behavior in the control condition in any of the five sessions as seen in Figure 4.4.
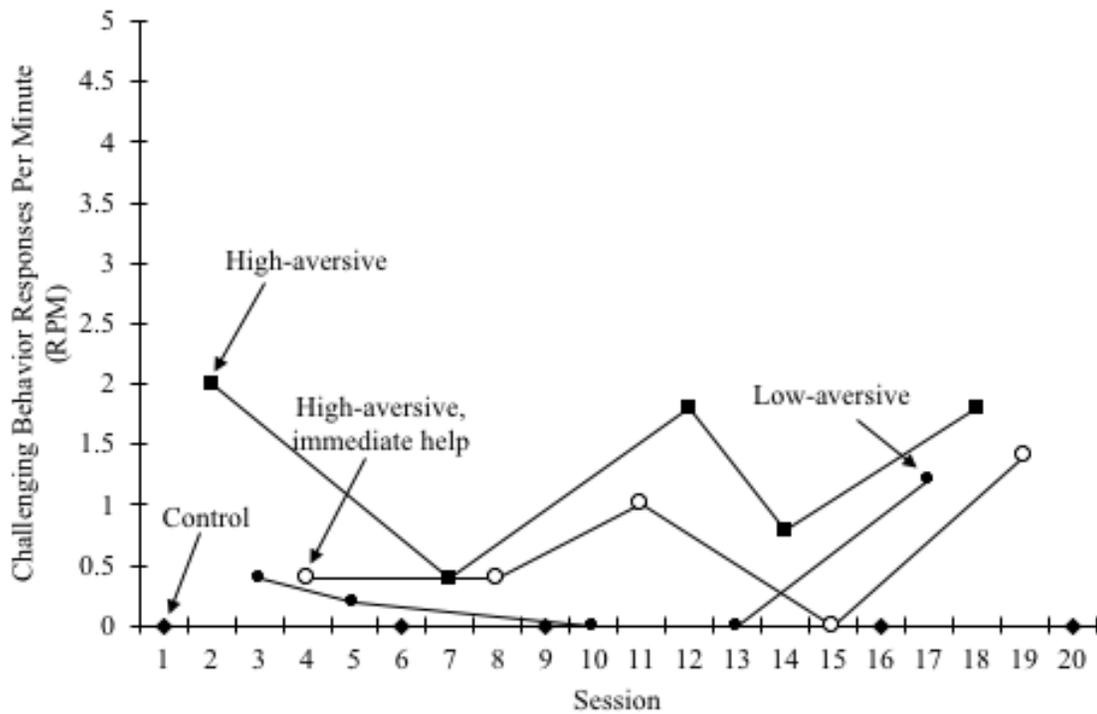
31

Figure A.4. Archie's modified functional analysis results.

Treatment Evaluation Results

Jones

During the initial baseline phase the data were variable and the overall trend of challenging behavior was increasing with an average level of 27% (range 3 to 66%). The average level during the initial intervention phase was 4% (range 0 to 10%). There was also a stable trend, no variability, and an immediacy of effect in this intervention phase. There were overlapping data points between the initial baseline and the initial intervention phase as well as in the last baseline and last intervention phase. In the second baseline phase the average level of challenging behavior was 28% (range 20 to 40%). In the second intervention phase, the average level of challenging behavior was 33% (range 0 to 73%). In the last baseline phase, the average level of challenging behavior was 36%

32

(range 26 to 53%). In the last intervention phase, the average level was 13% (range 3 to

23%). In this phase there was also a descending trend with slight variability and no

immediacy of effect observed (see *Figure A.3*). Overall, there are four demonstrations of

effect and one non-demonstration, resulting in moderate evidence supporting a functional

relation between the intervention and decrease in challenging behavior for Jones (What

Works Clearinghouse [WWC], 2017) as seen in Figure 4.5.
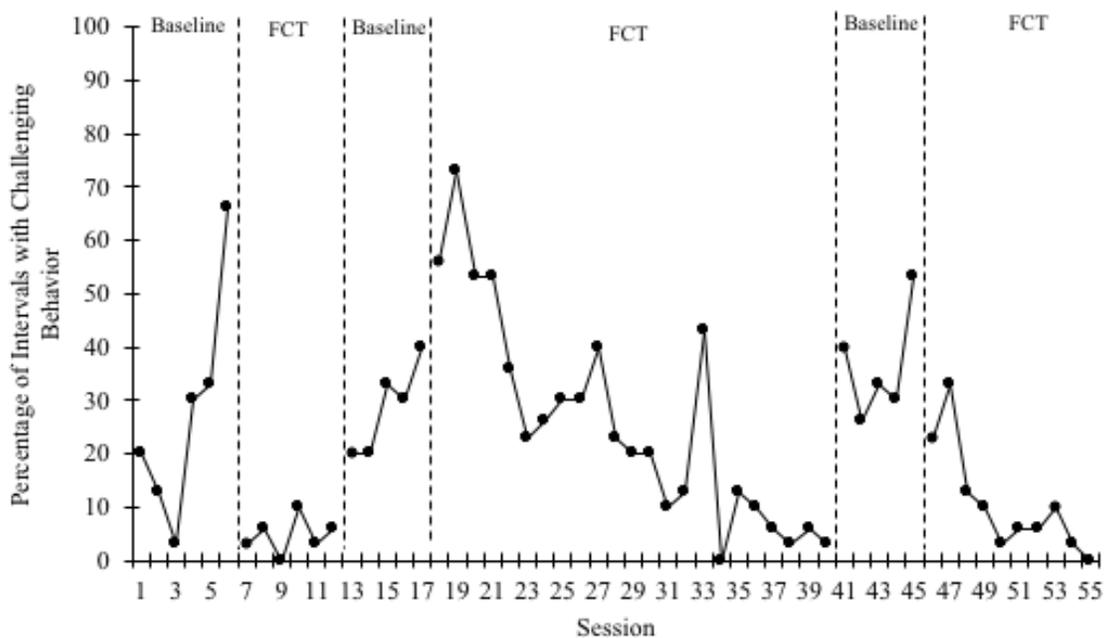

Figure 4.5. Jones's treatment evaluation results.

Archie

For Archie, the initial baseline phase was associated with variable rates of

challenging behavior as seen in Figure 4.6. For this reason, the implementer assessed data

on the percent accuracy during baseline. The average percent accuracy was 87% (range

50 to 100%). Therefore, a treatment evaluation was not conducted with these demands

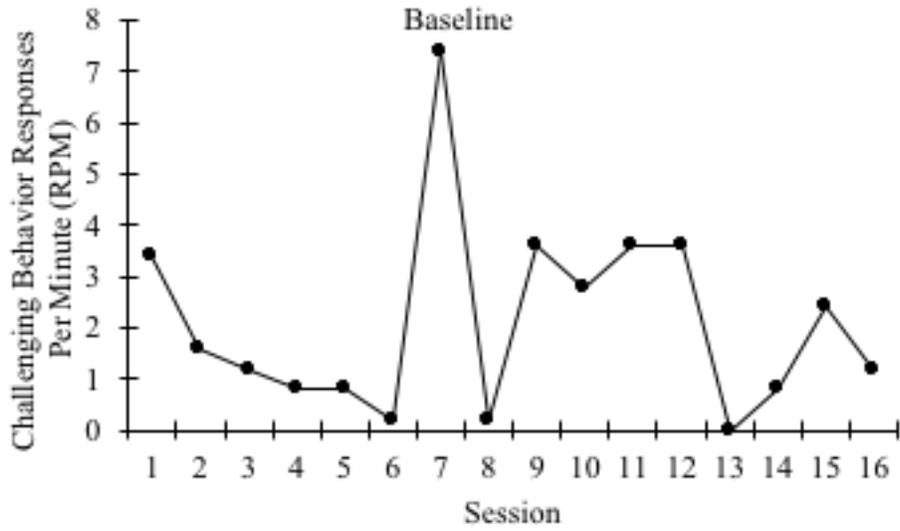because they were no longer high-aversive, low-accuracy demands as seen in Figure 4.7.

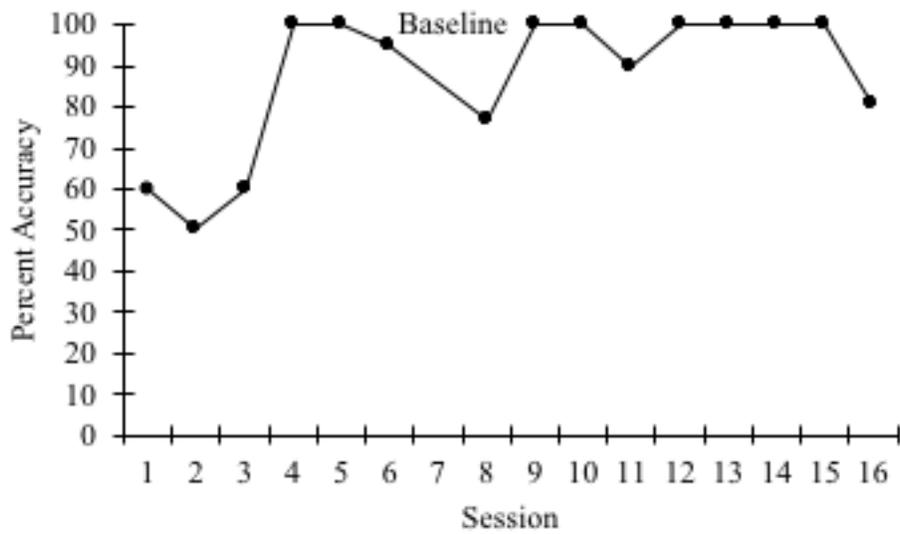*Figure A.6.* Archie's treatment evaluation baseline results.

Figure A.7. Archie's percent accuracy during treatment evaluation results

CHAPTER FIVE

Discussion

Conclusions

The demand assessments resulted in the identification of low-accuracy, high-aversive demands. For both participants, low-accuracy demands were associated with a shorter latency to challenging behavior compared to high-accuracy demands on average. These results demonstrate that for these participants, there was a relation between task accuracy and latency to challenging behavior. The modified functional analysis results indicated that for high-aversive, low-accuracy demands, immediate help resulted in a decrease in challenging behavior compared to high- aversive, low-accuracy demands without immediate help. These findings suggested that teaching the functional communicative response "help" and providing help contingent upon the communicative response might decrease the value of engaging in escape maintained challenging behavior and therefore might serve as an abolishing operation and decrease the frequency of escape maintained challenging behavior. The treatment evaluation results indicated that teaching the phrase "help" decreased challenging behavior for one participant (i.e., Jones).

For Archie during the initial baseline condition of the treatment evaluation variable data were observed. Therefore, data on his percent accuracy during baseline was extracted and demonstrated that his average percent accuracy for the initial baseline condition was higher than 50%. This indicates that matching was no longer a low-accuracy demand. Therefore, it would not be socially valid to teach Archie to request

35

help for demand completion since he was already completing the demands independently and accurately on an average of 87% of the trials. These results also indicate that the token economy and least-to-most prompting procedures might be an effective intervention in reducing challenging behavior and increasing task accuracy.

Limitations

The first limitation to address is the tool used to select demands for the demand assessment was indirect and included domains rather than specific demands (Call et al., 2009). Also, there were only two participants in this study and only one participant completed the treatment evaluation. Therefore, it is not clear whether this intervention is effective in reducing challenging behavior across participants. Another limitation for this study is that data were not collected for Jones's percent accuracy during the treatment evaluation. Furthermore, there was no comparison of the efficacy of the intervention in reducing challenging behavior associated with high-accuracy, high-aversive demands and low-accuracy, high-aversive demands. Lastly, the procedures need to be modified during the intervention conditions to encourage independent responses by the participant for both task completion and communication.

Future Research

The current study can be expanded to include fading procedures after the intervention for both communication and task completion to promote independence. Also, future research could replicate these procedures with individuals diagnosed with other developmental disabilities and with individuals of varying ages to test the generalizability of the results. Next, the current study could be replicated in various locations other than a clinic for children with developmental disabilities to also assess the

generalizability of these findings. Also, further research needs to be conducted to continue the evaluate the efficacy of the intervention based on accuracy during the demand assessment. Lastly, this study informs future research by expanding upon current demand assessments and interventions for escape maintained challenging behavior.

Conclusions and Implications for Practice

This study provides information that practitioners can use in the assessment and treatment of escape-maintained challenging behavior. Practitioners should consider evaluating the extent to which immediate help serves as an abolishing operation for challenging behavior prior to developing a treatment. In cases in which immediate help does decrease the value of engaging in escape maintained challenging behavior, teaching the client to ask for help for task completion may be beneficial because the client does not avoid work completion, but the motivating operation for engaging in challenging behavior still decreases.

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