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ABSTRACT

Assessing the Effectiveness of an In-Home Training Program for Parents of Children with Autism or Related Developmental Delays: A Multiple Baseline across Parent Skills

By

Robyn Aziza Williams

December 1, 2017

Autism spectrum disorders (ASD) are characterized by difficulty in communication and social interaction, and repetition of behaviors, requiring focused intervention efforts over time. Research has supported the role of parents as intervention agents in improving their children's behavior, but relatively little of this research has been conducted in the home. This study examined the effectiveness of an in-home intervention of five two-hour sessions combining positive behavior supports (PBS) with the provision of visual supports (VS). The Positive Behavior Visual Support (PBVS) curriculum was developed by the Center for Leadership in Disability at Georgia State University and was previously implemented with both individual in-home and group delivery. In the present study, we wanted to examine more closely the session-by-session acquisition of parental skills using the PBVS curriculum. A single-subject multiple baseline design was used with one family, and partially replicated with a second, to document whether parent training on PBS increased the use of specific skills and whether that, in turn, had an effect on child problem behaviors. We hypothesized that the parents who participated in the PBVS study would increase their use of the positive behavior approaches, which would be accompanied by a decrease in one or more of their children's targeted challenging behaviors. We looked at five positive behavior parenting skills, as well as child behaviors, during parent-child interaction sessions. We also predicted that parents would report a decrease in stress and an increase in knowledge and self-efficacy. One family withdrew from the study after three sessions so no follow-up was available. Results from the multiple baseline failed to support the predicted outcomes as both parent and child behaviors were quite variable from session to session. This family did demonstrate enhanced self-efficacy and parenting knowledge following the training. The brief time frame (only five sessions), paired with the relative long in-session time spent on parenting strategies (approximately 90 minutes per session), and that the data collection occurred in the first 15 minutes of the session (no time for warm-up or reminders) may have mitigated finding more specific session-by-session changes in behavior.

Key words: Autism Spectrum Disorder, challenging behaviors, parent training, positive behavior support

Assessing the Effectiveness of an In-Home Training Program for Parents of Children with
Autism or Related Developmental Delays: A Multiple Baseline across Parent Skills

by

Robyn Williams

B.S., College of William and Mary

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30303

APPROVAL PAGE

Assessing the Effectiveness of an In-Home Training Program for Parents of Children with
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by

Robyn Williams

Approved:

A handwritten signature in cursive script, appearing to read "Daniel Crimmins".

Dr. Daniel Crimmins
Committee Chair

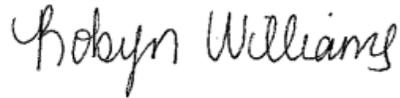
A handwritten signature in cursive script, appearing to read "Emily Graybill".

Dr. Emily Graybill
Committee Member

December 11, 2017

Author's Statement Page

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A handwritten signature in black ink that reads "Robyn Williams". The signature is written in a cursive style with a large initial 'R' and 'W'.

Robyn Williams, Author

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1. Introduction & Literature Review

Autism spectrum disorders (ASD) are characterized by difficulty in communication, social interaction, and repetition of behaviors (Beaudoin, Sebire, & Couture, 2014). About 1 in 68 children in the United States fall somewhere on the autism spectrum, making it one of the most frequent developmental disorders (Christensen et al., 2016; Beaudoin et al., 2014). The incidence of ASD has increased threefold since 1994 warranting more attention to the need for evidence-based intervention for ASD (Schultz, Schmidt & Stichter, 2011).

Specialists are often able to identify a child with ASD within the first two years of life, however, parental concerns about development can begin as early as 12 months (Beaudoin et al., 2014). In response to this, parents of children diagnosed with autism are encouraged to become active participants in applying positive behavioral interventions at home and as early as possible (Crockett, Fleming, Doepke, & Stevens, 2007).

Little research has been done on in-home parent training for children with autism, however, research does support the potential of parents as “intervention agents” and as “effective mediators” of child behavior (Crockett et al., 2007). Positive behavior support (PBS) is increasingly a preferred method for intervention. PBS is based upon Applied Behavioral Analysis (ABA) and considers ecological conditions that increase the likelihood of challenging behaviors; identifies triggers associated with challenging behaviors; and identifies needs and communication style (Preece, 2014). Parents trained on PBS can learn proactive strategies to change challenging behaviors long-term and reactive strategies to manage behaviors when they occur (Preece, 2014).

1.1 Parent Training for Parents of Children with Autism

A child's relationship with his or her parent is one of the most stable relationships a child has (Shire et al., 2014). Parents have the ability to influence their child's life in ways that are unlike other relationships that may come and go (Shire et al., 2014). Therefore, it is important to recognize parent's pivotal role in their children's lives and have them as the focus of intervention and training programs. Parents face daily challenges of nurturing, providing basic care, and establishing relationships when their child has ASD (Schultz et al., 2011). Children with ASD often have difficulty learning and may be lacking in certain skill sets which makes finding a curriculum for parents difficult but very important (Schultz et al., 2011). Parent education serves to improve the outcome of these challenges by informing parents and teaching them new skills (Schultz et al., 2011).

Parent training has three main purposes: to increase knowledge and skills on how to manage behavior, teach communication skills, and teach social skills (Schultz et al., 2011). Parents can be effectively taught to implement behavioral procedures and concepts such as prompting, shaping, reinforcements, data collection, and maintenance to promote these skills (Crockett et al., 2007). In a study by Scahill and colleagues, researchers found that parents in the study group who were trained on behavioral procedures were more successful at managing disruptive behaviors than parents who just received education (Scahill et al., 2016). Results also showed that in daily living and socialization the parent training group showed an improvement over baseline (Scahill et al., 2016). Because children with ASD often struggle with social communication, it can be challenging for parents to engage with their child especially during daily activities (Shire et al., 2014). However, it is important to teach parents how to facilitate

meaningful and shared interactions with their children. This can occur during play, which has been proven to decrease the frequency of behavioral problems in ASD children (Sari, 2014).

Parent training may lead to an increase in self-competency and a decrease in parental stress, which can be high in families with ASD. Davis and Carter (2008), for example, found that when compared to parents of typically developing children, parents of children with ASD, as well as those whose children had a social or communication deficit, reported higher levels of stress. Another study by Estes and colleagues (2009), found that mothers who had children with ASD experienced higher stress and psychological distress than mothers of children with developmental delays but not autism. Regardless of group membership, there was direct link that higher levels of challenging behavioral problems were associated with increased parental stress in mothers (Estes et al., 2009). Therefore, a reduction in disruptive behavior can reduce stress in the parent's daily life.

In-home Parent Training. The most important components in implementing an early intervention are that it be time intensive, implemented by trained professionals, actively involves the parent, and starts before the child begins preschool (McGee, Morrier, & Daly, 1999). Despite the encouragement of applying early behavioral interventions in the home, many interventions take place in the classroom with teachers or therapists (Crockett et al., 2007). However, meeting the family where they are and intervening at home is beneficial, especially during the toddler years. In-home training programs provide the opportunity for earlier interventions to occur and to reach the child before some ASD characterizations can fully develop (Crockett et al., 2007).

1.2 Positive Behavior Support for Young Children with Autism

Approximately 50-70% of children with ASD display disruptive or challenging behaviors (Bearss, Johnson, Handen, Smith, Scahill et al., 2012). The most common challenging behaviors

in children with ASD include tantrums, aggression, self-injury, noncompliance with routine demands, property destruction, recklessness, and hyperactivity (Bearss et al., 2012). There are four functions or motivations of behaviors that are critical to understanding and managing misbehavior in children with ASD. The four functions are (1) sensory – the behavior stimulates one of the senses, (2) attention – the behavior serves to receive attention from someone else, (3) tangible – the behavior provides a way to gain access to an object, and (4) escape – the behavior is a means of getting out of a situation or task (Joosten & Bundy, 2008). One approach to understanding why difficult or problem behaviors persists is the ABC analysis. There is always an antecedent or A, which comes before and triggers the target behavior (Friedman, 2000). Following the trigger, the behavior or B, occurs (Friedman, 2000). Then there is a consequence or C, which follows the behavior and may reinforce the behavior (Friedman, 2000). Each must be evaluated in the sequence they occur to truly understand the target behavior and develop an approach to change the behavior (Friedman, 2000). Parents often do not respond appropriately to children’s behaviors and often may unknowingly reinforce the challenging behavior (Chu, 2015). It is common for parents to reward or punish their children with verbal consequences of praise or reprimand (Owen, Slep, & Heyman, 2012). Repeated praise and reprimand develop a social context for a child’s behavior (Owen et al., 2012). Parent training interventions promote positive reinforcements through praise (Leijten, Thomaes, Orobio, Dishion, & Matthys, 2016). Therefore, it is important to involve families and help them understand how and why the behavior functions (Chu, 2014).

The PBS model stemming from ABA aims to address problem behaviors with a supportive approach (Chu, 2015). There are five components of PBS: “collaborative partnership with family members; functional assessments; attention to family goals, values, skills, and

resources to ensure that support plans possess a good contextual fit with family life; multicomponent support plans; and daily and weekly routines as a unit of analysis and intervention” (Lucyshyn et al., 2007). PBS has been proved to be effective in helping to decrease problem behaviors in children. In a single-subject design study by Chu (2014), parents reported a decrease of the targeted challenging behaviors as well as a decrease of parental stress within a model in which the behavior plan also meets the needs of the family’s values, strengths, and resources.

1.3 Visual Supports for Young Children with Autism

Visual supports (VS) can be a useful aid when language and communication are limited in children with ASD. VS can be used in many settings including school, home, and the community and can come in a variety of visuals displays (Rao & Gagle, 2006). Some children with autism are visual rather than auditory learners; because of this visual supports are useful as they provide a universal way to communicate, attract and hold attention, make concepts concrete, and give the child the ability to express his or her thoughts (Rao & Gagle, 2006).

Types of visual representations include real objects that can be a tangible representation of activities; pictures that can be used to represent activities and routines; and words that are recognizable and can be used as visual representation or in combination with pictures (Meadan, Ostrosky, Triplett, Michna, & Fettig, 2011). VS have proven to be effective for young children with ASD and used for daily schedules, scripts, or task analysis (Meadan et al., 2011). VS allow children to interact with their peers, teachers, parents, siblings, or therapists despite their level of impairment in communication (Rao & Gagle, 2006).

1.4 Purpose of Current Study

This study attempted to discover the effectiveness of an in-home intervention that combined the PBS with the provision of VS. The Positive Behavior Visual Support (PBVS) was developed by the Center for Leadership in Disability at Georgia State University. The PBVS Program has been previously implemented with both individual in-home and group delivery. The group parent training known as Parent Academy was provided to more than 125 families of children receiving services through Babies Can't Wait --Georgia's early intervention program for children with disabilities (Center for Leadership in Disability, 2016). The majority of parents in the Leadership Academy had children with neurodevelopmental disabilities including autism. The Parent Academy produced positive results of increased self-efficacy in parents and improved communication and behavior in their children (Center for Leadership in Disability, 2016).

In the present study, we wanted to examine more closely the acquisition of parental skills using the PBVS curriculum. We sought two to four families with children with challenging behaviors and neurodevelopmental disabilities. We hypothesized that the parents who participated in the PBVS study would increase in use of the positive behavior approaches and that we would see a decrease in one or more of their children's targeted challenging behaviors. We looked at five positive behavior skills during parent-child interaction and collected data throughout the sessions: directive statements ("do" and "don't"), praise, verbal prompts, nonverbal prompts/physical gestures, and visual aids. In addition to those skills, we recorded occurrence data on each child's problem behaviors during the face-to-face sessions, as well as, had parents report how many times the target behavior occurred in the past week (See Appendix A). In addition, we predicted that parents would report a decrease in stress and an increase in knowledge and self-efficacy.

2. Methods & Procedures

2.1 Participants

Following the approval of the proposed research by the Institutional Review Board at Georgia State University, the families were recruited through professional contacts (e.g., e-mail announcement to Babies Can't Wait providers). The inclusion criteria were as follows: the parent expressed interest and willingness to set up weekly visits with a low likelihood of interruptions; the family included a child between the ages of 2 and 5 with a diagnosis of ASD or persistent challenging behaviors and communication difficulties; and the parent had not participated in a behavioral parent training program in the past 12 months.

Six families reached out about participating in the study. A telephone screening interview was conducted by an early childhood behavior specialist and the study author. The families were informed about the study and inclusion data criteria. One family could not participate due to having a younger child who was likely to require attention during the study sessions. Three families were not able to participate due to scheduling conflicts with the study sessions. Primary caregivers were the targeted participants; these included mothers, fathers, and grandparents. The child with ASD or challenging behaviors was the secondary participant. Participant characteristics are outlined below in Table 1. All criteria and details were included in the informed consent which was signed and dated by the parent which permitted the parent and child to participate in the study.

Two families, the Campbell's and Davis's (note for the purposes of privacy, the family surnames and children's names are fictional), participated in the PBVS study. In each family, the parent(s) were employed, educated, spoke English as a first language, had one or two children including their child with ASD. Matthew Campbell had delayed language and only

communicated a few words. His expressive language had decreased after age three. Carter Davis did not have an official diagnosis of ASD, however, was referred by Babies Can't Wait due to social and behavioral problems.

Table 1. *Participant Characteristics*

Family	Parent Characteristic	Child Characteristics
Campbell family included mom, dad, and son Matthew.	<ul style="list-style-type: none"> • Mother and father participated • College 4+ years • Employed full time • Caucasian 	<ul style="list-style-type: none"> • 5 years old • 1 sibling • Caucasian • Self-contained classroom • ABA therapy • Problem behavior: crying
Davis family included mom, grandparents, and son Carter.	<ul style="list-style-type: none"> • Mother and grandparents participated • College 4 years • Employed full time • Caucasian • Grandparents are retired and secondary caregivers 	<ul style="list-style-type: none"> • 2 years old • No siblings • Mixed race (Caucasian and African American) • No therapies at the time of the study • Problem behavior: tantrums

2.2 Setting and Materials

The study sessions took place in each of the family's homes. The sessions and training were conducted in the same room in each home. However, play occurred in two settings for the Campbell family, either in the family room, where the sessions took place, or in the basement where there was an indoor playground consisting of a swing, mini rock climbing wall, slide, and trampoline. The parent-child play for the Davis family always took place in the basement that served as a playroom.

Each family received a binder with an outline of the PBVS study curriculum, a copy of their informed consent, and a Milestone Moments booklet that identified clues to child development at certain ages (Shevlov & Altmann Eds., 2009). During session 3, the parents also received a VS toolkit, including schedule boards, now-then boards, and picture cards with many common objects and activities, which was designed to enhance communication and make daily routines easier. Toys and activities used during the parent-child play time were provided by the families.

2.3 Measurement Procedures

Positive Behavior Support Self-Reported Knowledge Assessment. The Self-Reported Knowledge Assessment was developed by Dr. Emily Graybill at Center for Leadership in Disability at Georgia State University (See Appendix B). The original version was designed for use by educators receiving PBS training in school settings. The assessment was then modified by Dr. Lillie Huddleston to evaluate training outcomes for early intervention providers working with the Babies Can't Wait program. There are no validity or reliability studies on this tool. Therefore, it served as an informal information-gathering measure (A, O'Hara, personal communications, November 17, 2017).

Eyberg Child Behavior Inventory. The Eyberg Child Behavior Inventory (ECBI) is a 36-item assessment tool used to assess challenging behaviors in children (Eyberg, Sutter, & Pincus, 1978; Jeter, Zlomke, Shawler, & Sullivan, 2017). The intensity scale assesses the frequency at which the child displays the disruptive behavior. The problem scale assesses the degree that the parent considers the behavior to be a problem. Parents rate behaviors on a 7-point intensity scale and a yes-no problem scale (Eyberg et al., 1978). The sums are totaled, and then the problem and

intensity scores are converted on the T-score conversion chart. A T-scores of 60 or higher exceeds the cutoff meaning that the behavior is significantly problematic (Eyberg et al., 1978).

Motivation Assessment Scale (MAS). The Motivation Assessment Scale developed by Drs. Mark Durand and Daniel Crimmins is a widely used indirect functional assessment used to determine the likely function (e.g., sensory, escape, attention, and tangible) of the challenging behavior (Durand & Crimmins, 1988).

Parental Stress Scale. This scale focuses on “stress as a reaction to the environment in which loss occurs” (Berry & Jones, 1995). The 18 items on the scale reflect resource loss (e.g., time finances, energy), loss of self-esteem or control, and loss of expected gains from the parenting role (e.g., happiness, closeness, affection) (Berry & Jones, 1995). Half of the items emphasize greater stress while the other half indicate lesser stress (Berry & Jones, 1995). Items are answered on a 5-point scale of strongly agree, agree, undecided, disagree, and strongly disagree (See Appendix C). Items 1, 2, 5, 6, 7, 8, 17, and 18 are reversed scored, and then the numbers are totaled. The highest stress score possible is a 90.

Brief Behavioral Questionnaire and Intervention Plan Infant -Toddler Version (BBQuIP). The BBQuIP was developed by Dr. Daniel Crimmins to help parents develop action plans for their children’s challenging behavior. There are two parts in the infant-toddler version of the questionnaire. Part One asks questions that describe the child in a positive way and provides a guide to why the child engages in behavior (Crimmins, 2015). Part Two asks about ways the behavior can be prevented from occurring and suggests skills that the child needs to learn to replace the problem (Crimmins, 2015).

Direct observation of behavior. Table 2. Observation Measures Checklist shows the operational definition of each measure collected in this study. In general, the goals of the

intervention emphasize changes in parental behaviors, including increasing ratio of “do” over “don’t” directives over time; increased use of meaningful praise; increased ratio of verbal prompts over physical prompts; and that the participants would increasingly use VS in their interactions with their child. We anticipated that number of instances that the child presented challenging behaviors would decrease as parent skills increased.

Table 2. *Observation Measures Checklist*

Object	Operational Definition	Examples
Directive: “do” (Directive, n.d.)	An instruction to do something	“Walk, please.”
Directive: “don’t” (Directive, n.d.)	An official instruction to <i>not</i> do something	“Do not run.”
Praise (Praise, n.d.)	The expression of approval	“You did a great job picking up your toys!”
Verbal Prompts (Shaw, n.d.)	Verbal assistance given that helps use a targeted skill	Hints, clues, directions
Nonverbal Prompts/Physical Gestures (Shaw, n.d.)	The cue to use a behavior or skill through the use of gestures; guiding or touching to help child use the target behavior or skill	Pointing, touching, hand-over-hand
Visual Supports (Rao & Gagle, 2006)	A tool used that supports a child engaging in activities and routines.	Objects, pictures, drawings

Inter-rater agreement. There were three data collectors for the study, two early childhood behavioral specialists and a graduate student in public health. The graduate student was the study researcher and the primary observer. The graduate student was present and collected data for all sessions. The first early behavioral specialist had a Master in Social Work in community partnerships and was a licensed social worker. This behavioral specialist assessed and

documented three out of five sessions for the Campbell family and three out of three sessions for the Davis family. The second early behavioral specialist had a Specialist Education and Master of Science degree in professional counseling and was a licensed professional counselor. She assessed and documented the remaining two sessions for the Campbell family. Thus, two observers were present at each session. Interrater agreement was calculated by adding agreement on occurrence and agreement on nonoccurrence and dividing by the number of occurrences for each observation measure in each session.

2.4 Research Design and Procedures

Single-subject, multiple-baseline design. A single-subject multiple-baseline design was used to document whether parent training on PBS increased the use of specific skills and whether that, in turn, had an effect on child problem behaviors (Crone & Mehta, 2016). Multiple baselines were used to assess the introduction of curricular components over time (Kratochwill et al., 2010). The parent-child interaction was observed at the beginning of each session before the intervention parent training was given. This provided an opportunity for baseline in session one, and to document if the skills emphasized in the previous session carried over from session to session. Directives were introduced in session one after baseline data were taken. Training on praise was introduced in session two, and visual aids, verbal and physical prompts were introduced in session three. By session four all of the PBS strategies had been introduced with the intended goal of working on strengthening the skills. A visual analysis determined the changes in pretest and posttest measures as well as a change in baseline and intervention trend of the parent behaviors.

Baseline. Baseline data were collected at the beginning of the first session prior to the implementation of parent training. After introductions, parents were instructed to engage in play

with their child. During this time there was no effort by the observers to encourage or influence the direction of the parent-child play. Parents were instructed to engage in play doing activities in the same manner with their child as they would normally. The two observers collected data on the measures without specifically citing what behaviors were being observed.

Parent Training. Participants received five 2-hour long sessions that included parent training on PBVS strategies and support in developing a behavioral intervention plan. The Campbell family participated in five sessions, and the Davis family participated in three sessions. In the first session, both families completed Part 1 of the BBQuIP, ECBI, MAS, Parental Stress Scale, and PBS Self-Reported Knowledge Assessment. The Campbell family participated in the posttest conducted at the end of session five which included the ECBI, Parental Stress Scale, PBS Self-Reported Knowledge Assessment, and a Satisfaction Survey. In all of the sessions, ten minutes were designated in the beginning to observe parent-child play. Individual sessions are detailed below.

Session One:

- Introductions
- Informed consent and commitment contract signed
- Ten minutes of observation
- Pretest measures completed
- Part 1 of the BBQuIP completed
- Discussed *Milestone Moments* booklet
- Trained on directives (e.g., increase use of “do” directives, decrease “don’t” directives)

Session Two:

- Ten minutes of observation
- Checked-in and reviewed
- Part 2 of the BBQuIP completed
- Trained on praise

Session Three:

- Ten minutes of observation
- Discussed Community Supports
- VS toolkit
- Trained on VS, verbal, and physical prompts

Session 4:

- Ten minutes of observation
- Reviewed interaction and communication skills
- Reviewed VS toolkit

Session 5:

- Ten minutes of observation
- Skill maintenance
- Reviewed Milestone Moments
- Community resources and support
- Posttest surveys

3. Results

3.1 Parent Adherence

The Campbell family completed all five sessions of the PBVS study. The Davis family completed only three out of the five sessions, citing scheduling conflicts as the reason. Despite several attempts to encourage the Davis family to continue, they did not respond to the study researcher and did not complete any posttest surveys. Therefore, an analysis cannot be done to determine the effect of the parent training for this family.

3.2 Change in Pretest and Posttest Measures

Campbell Family.

There was a significant decrease in parental stress of 12.5% at the end of the intervention (Figure 1). Data from the Positive Behavior Self-Reported Knowledge assessment showed that for over half the questions parent knowledge improved (Figure 2). After completing Part One of the BBQuIP, the Campbell family decided to focus on crying. The MAS, which was used to establish the function of behavior for Matthew, suggested that his crying might serve to gain tangible outcome. The ECBI pretest for Matthew results showed that the behaviors that the parents reported as concerns were statistically problematic for both intensity and frequency (Table 3). Posttest results, however, were below 60, suggesting that Matthew's behaviors were judged as less problematic or intense than when the intervention first began.

Davis Family. Because the Davis family did not complete the five-session sequence, no posttest survey results are available to serve as comparisons. However, pretest data are reported below. The Davis family began with a stress score of 49 (Figure 3). A majority of the Self-Reported Knowledge Assessment questions were answered with low confidence and high confidence (Figure 4). After completing Part One of the BBQuIP, the Davis family focused on

tantrums that included yelling and hitting as their behavior of concern. The MAS suggested that function of Carter’s behavior was for tangible reasons. The ECBI pretest results showed that Carter’s behaviors were in the statistically problematic range for both intensity and frequency (Table 4).

Figure 1. *Campbell Family Parental Stress Scale*

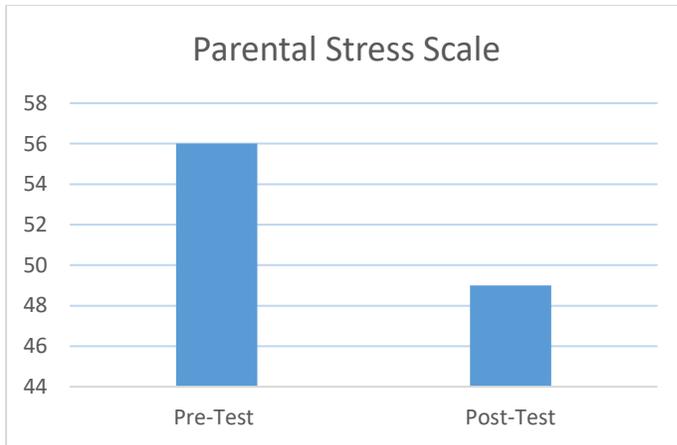
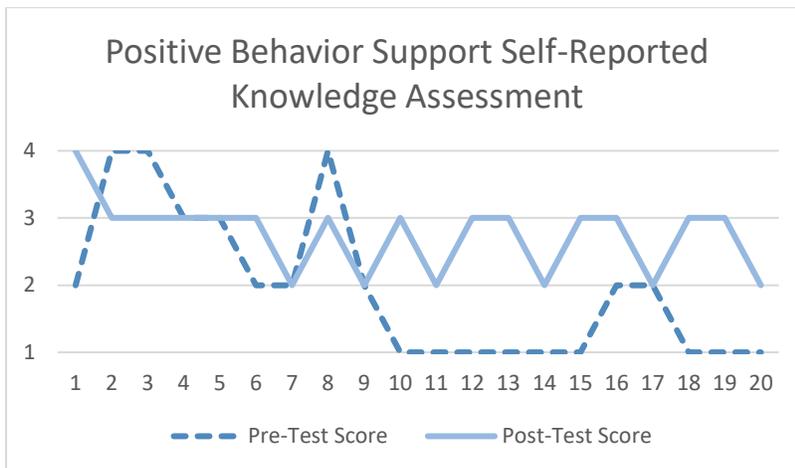


Figure 2. *Campbell Family Self-Reported Knowledge Assessment*



Note: 1=Very Low Confidence; 2= Low Confidence; 3= High Confidence; 4=Very High Confidence

Table 3. *Campbell Family Eyberg Child Behavior Inventory*

	Pretest			Posttest		
	Raw Score	T-score	Exceeds Cutoff	Raw Score	T-score	Exceeds Cutoff
Intensity	141	63	Yes	128	59	No
Problem	17	63	yes	12	56	No

Figure 3. *Davis Family Parental Stress Scale*

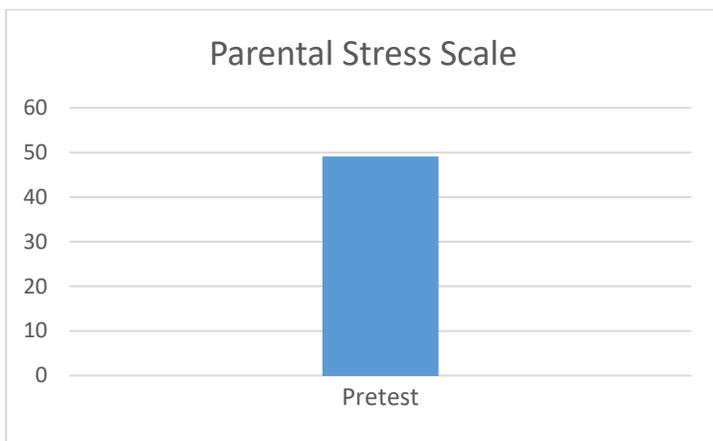
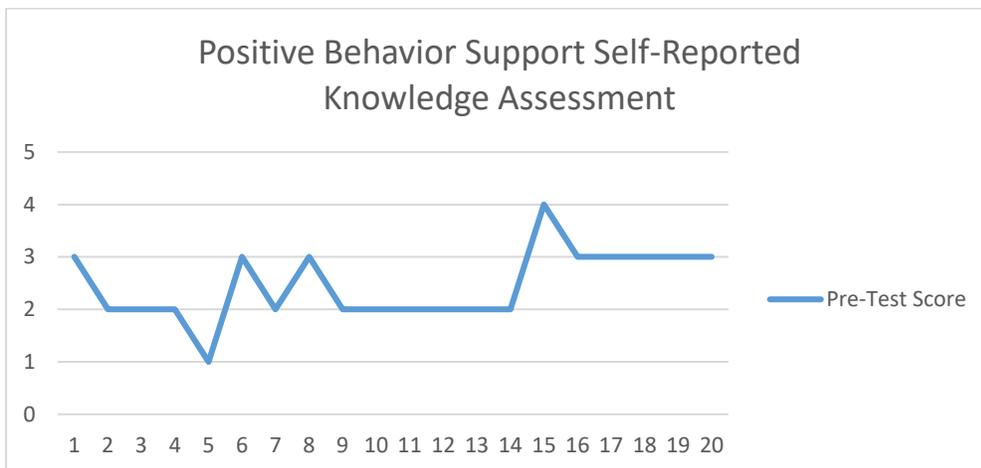


Figure 4. *Davis Family Self-Reported Knowledge Assessment*



Note: 1=Very Low Confidence; 2= Low Confidence; 3= High Confidence; 4=Very High Confidence

Table 4. *Davis Family Eyberg Child Behavior Inventory*

	Pretest		
	Raw Score	T-score	Exceeds Cutoff
Intensity	173	72	Yes
Problem	20	67	yes

3.3 Change in Parent Behavior

Baseline. Figure 5 shows the percentage of PBS behaviors displayed during parent-child play by the Campbell’s. Figure 6 shows the positive behavior support measures that were observed in the three sessions that the Davis family participated in. During the baseline phase, the Campbell’s displayed low use of directives (0-5% of the 30-second intervals) and visual aids (0-20%). There was a higher percentages of praise and verbal and physical prompts going as high as 53% (praise) and 87% (verbal and physical prompts). The Davis family maintained a baseline percentage of 0-15% for all behaviors except for verbal and physical prompts. These were used at higher percentages in the first three sessions.

Directives. After the intervention for the Campbell family, “Don’t” directives remained 0 as they had prior to the intervention. “Do” directives increased during session four (22%) but decreased again in session five (10%). The Davis’s directives for “Do” statements decreased from 15% to 5% after the intervention was implemented. “Don’t” directives increased to 5% in session two after the implementation and then decreased back to 0%.

Praise. Praise, which was introduced during session two, decreased after the intervention and went from 33% to 25% for the Campbell’s. Praise for the Davis’ also decreased following implementation from a peak of 10% down to 0% in session three.

VS and prompts. For the Campbell’s, VS were not used during play following the intervention. And verbal prompts went down to below baseline percentages at only 60% in

session five, and physical prompts were significantly lower than baseline numbers as well, only 44% and 55% in sessions four and five respectively. For the Davis family, VS, verbal and physical prompts were kept at baseline. These parent behaviors were taught in session three, the last session for this family, following the data collection. VS were only used in session two (10%), prior to that parent behavior being taught. Verbal prompts, however, were used a great deal with 100% use throughout the 10 minute play time.

Figure 5. Campbell Family Multiple Baseline across Parent Behaviors

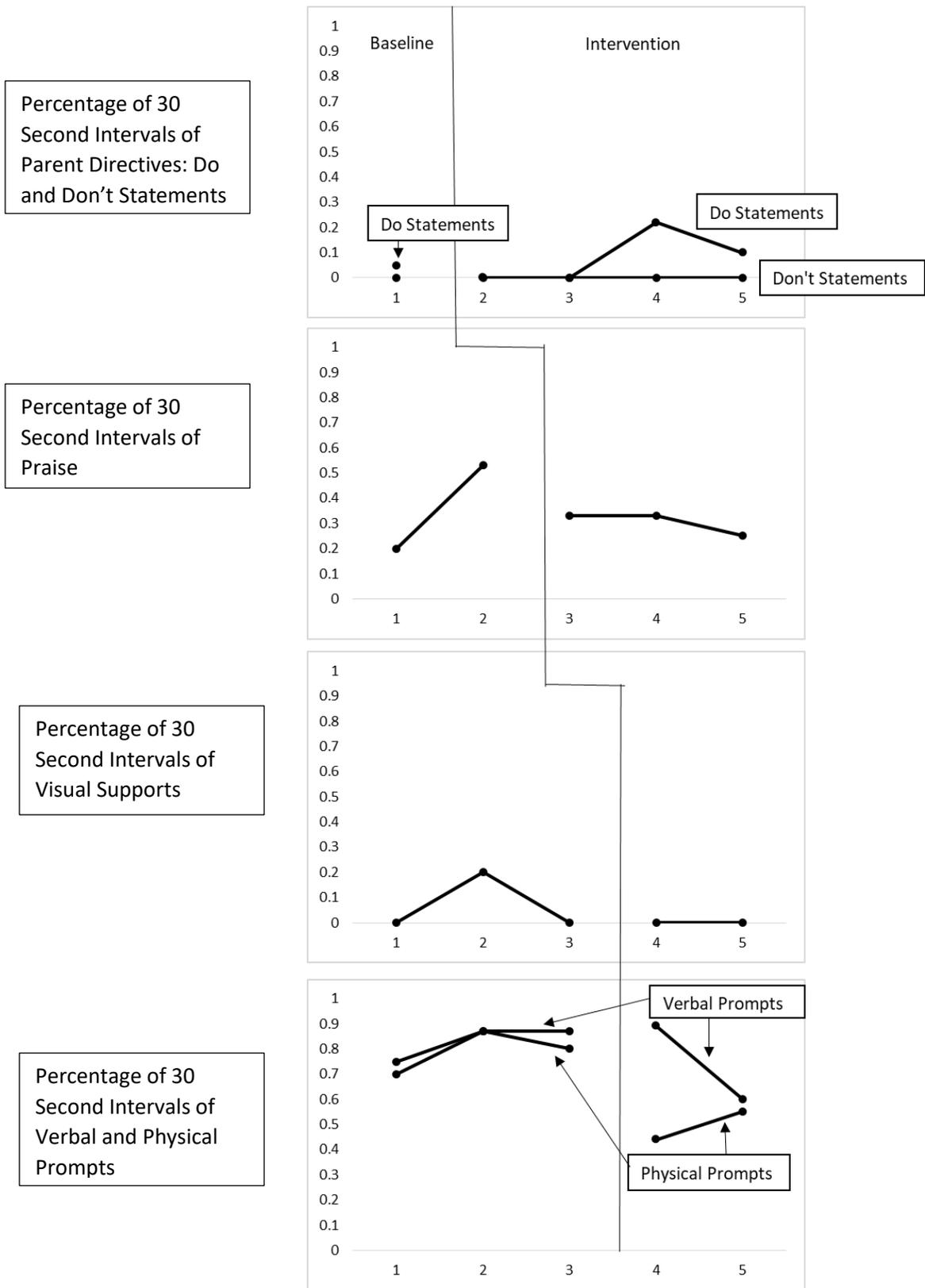
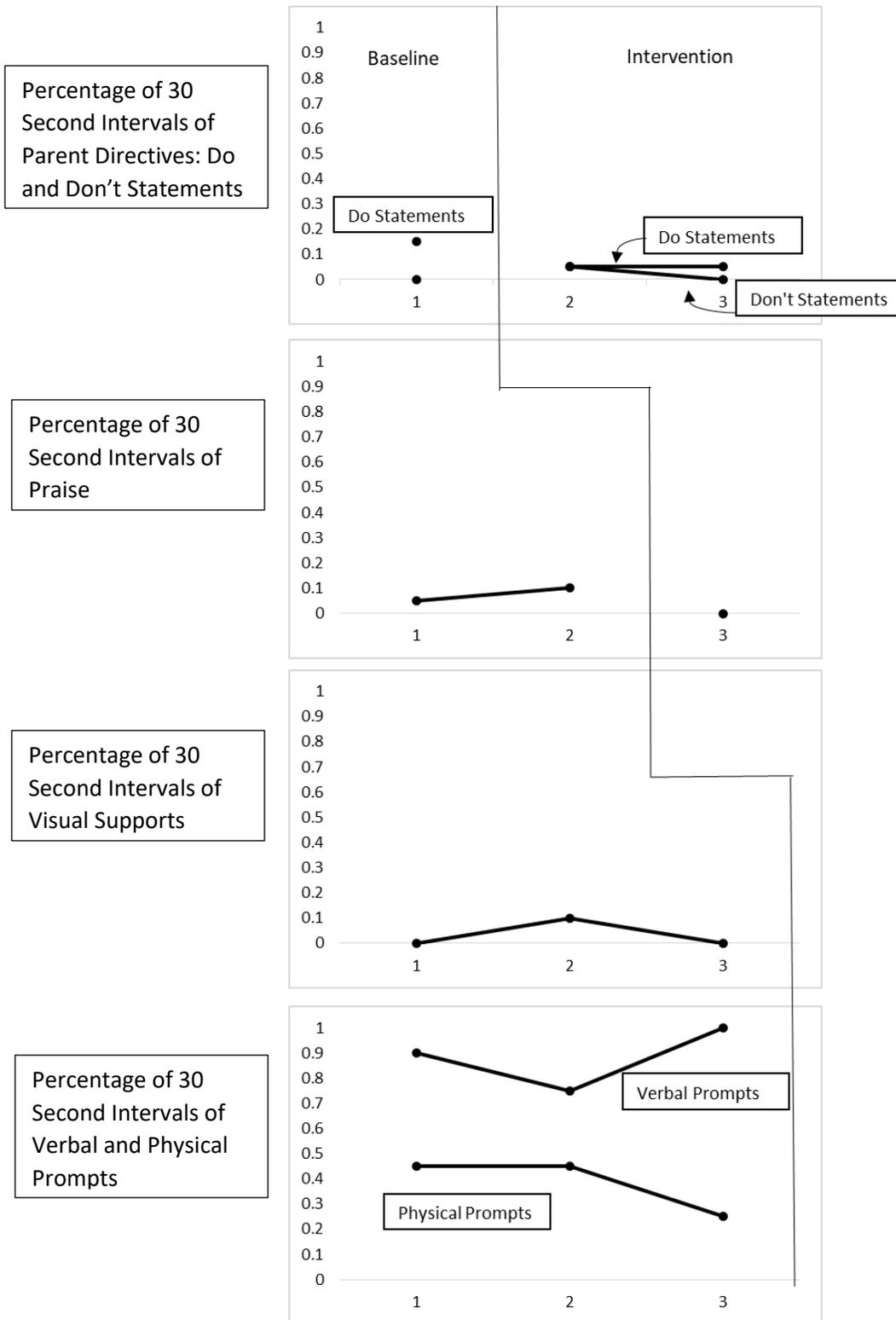


Figure 6. Davis Family Multiple Baseline across Parent Behaviors



Interrater Agreement. The joint probability of agreement was assessed in Tables 5 and 6.

The absolute agreement was determined by adding the times that both raters agreed on occurrence and non-occurrence divided by the total number of occurrences for the PBS measures. An acceptable level of agreement is 0.8, which was met for the behavior data observation for both families.

Table 5. *Campbell Family Inter-rater Reliability Agreement*

	Session 1	Session 2	Session 3	Session 4	Session 5	Average
Do Statements Don't Statements	0.70	1.00	1.00	0.67	0.90	0.85
Praise	0.90	1.00	1.00	1.00	1.00	0.98
Verbal Prompts	0.75	0.87	0.67	0.77	0.80	0.77
Nonverbal Gestures	0.75	0.93	0.87	0.44	0.55	0.71
Visual Aids	0.60	0.73	0.47	0.67	0.75	0.64
	0.75	1.00	1.00	1.00	1.00	0.95
						0.82

Table 6. *Davis Family Inter-rater Reliability Agreement*

Behavior	Session 1	Session 2	Session 3	Average
Do Statements	0.75	0.95	0.95	0.88
Don't Statements	1.00	0.95	1.00	0.98
Praise	0.85	0.95	1.00	0.93
Verbal Prompts	0.75	0.75	1.00	0.83
Nonverbal Gestures	0.55	0.55	0.75	0.62
Visual Aids	1.00	0.90	1.00	0.97
				0.87

3.4 Change in Child's Challenging Behavior

Data were collected starting in session three after the challenging behavior was firmly decided. Matthew's challenging behavior was crying. In the third session, we observed Matthew crying on three occasions. In session four and five, no crying was observed (Table 7). His alternative positive behavior was to "lead" his parents to get items or preferred activities.

Leading was defined as a hand grab and then initiating movement. We observed the alternate behavior twice in session three and five and once in session four (Table 7). Parent’s reporting of crying also decreased from 14 to 1 instance in a week between sessions three and five (Table 8). Parents reported that Matthew lead them 35 times in the week prior to session 5 (Table 8). We were able to report data on Carter Davis during session two and three. The target behavior was tantrums that included hitting and crying. We observed the behavior three times in session two and the mother reported that the behavior had occurred three times in the past week (Table 9 and Table 10). In session three we did not observe any tantrums, however, his mother reported that Carter had had seven tantrums in the past week (Table 9 and 10). An alternative behavior was not established for Carter before withdrawing from the study.

Table 7. Campbell Family Observed Behavior during Sessions

	Targeted Behavior	Alternate Behavior
Session 3	3	2
Session 4	0	1
Session 5	0	2

Table 8. Campbell Family Parent Report Number of Instances in a Week

	Targeted Behavior	Alternate Behavior
Session 3	14	N/A
Session 4	3	5
Session 5	1	35

Table 9. Davis Family Observed Behavior during Sessions

	Targeted Behavior	Alternate Behavior
Session 2	3	N/A
Session 3	0	N/A

Table 10. Davis Family Parent Report Number of Instances in a Week

Column1	Targeted Behavior	Alternate Behavior
Session 2	3	N/A
Session 3	7	N/A

4. Discussion and Conclusion

Research has supported the role of parents as intervention agents in improving the behavior of their children with autism, but relatively little has been conducted in the home (Crockett et al., 2007). This study utilized a parent training curriculum developed by the Center for Leadership in Disability to support the acquisition of PBS skills in parents of children with autism and challenging behaviors. We looked at parental skills using the PBVS curriculum in a single-subject multiple baseline design. We wanted to see an increase in parent skill and a decrease in the child’s challenging behavior. We also predicted that education on PBS would lead to decreased parental stress and increased knowledge and self-efficacy.

The measures collected both before and after the intervention (PBS Self-Reported Knowledge Assessment, Parental Stress Scale, and ECBI) did demonstrate a change in positive directions at the end of the PBVS study sessions. Increases in parent self-knowledge, decreased parental stress, and improvements in parent-reported challenging behaviors were observed. The parents were also very satisfied with the intervention as stated in their Satisfaction Survey. They answered that as a result of the PBVS intervention they know “how to anticipate and deal with crying and how to notice subtle communications,” they are “more aware of communication attempts” and that they would make no changes regarding the program.

Findings from this study are consistent with the results of the Babies Can’t Wait-Positive Behavior and Visual Supports Project and the Positive Behavior Supports Parent Academy, which have been carried out by the staff of the Center for Leadership in Disability in prior years.

Both evaluations saw a significant decrease in stress, significant gains in knowledge related to PBS, and reported lower intensity of challenging behaviors (Crimmins & Huddleston, 2016; Crimmins & Huddleston, 2017). Based on responses, parents also had positive perceptions of the PBS curriculum, materials, and personnel (Crimmins & Huddleston, 2016; Crimmins & Huddleston, 2017).

The results of the parent behavior data, which were observed and collected during the ten minutes of parent-child play, were inconclusive. Many of the parent behavior skills that were expected to increase did not do so in the manner predicted. Don't directives remained at zero which is what we wanted to see happen. However, VS, praise, and do directives were not used as much as we had expected. Verbal prompts were used more over physical prompts, however, after baseline the use was low. One reason for this may have been that parents did not have a structured task during parent-child play. Parents were instructed to 'interact' or 'play' with their child as they would normally. Because there was not a specific task, the parent's form of play or activity may not have been conducive to requiring the prompts to demonstrate PBS skills and we may have missed opportunities for capturing parent behaviors. In the future, it would be important to also require the parents to complete a task with their child, which would allow more opportunities for these skills to be presented.

Matthew's challenging behavior of crying decreased over sessions both for the observers and his parents. While it cannot be concluded that this was due to changes in his parent's styles of interacting, the parents did report that they were better at understanding their child's needs and were more equipped with strategies to deal with the challenging behavior.

The Davis family withdrew from the study after the third session making it difficult to see any trends in pretest-posttest measures, parent behavior, and child behavior. This challenge

arose despite the fact that the intervention was relatively short, was implemented in the home, and many attempts were made to work around schedules. There are parent variables that influence outcomes including socioeconomic factors and parental mental health (Reyno & McGrath, 2006). In the future, it would be beneficial to gather more demographic data on the parents to track what predictors likely determine completion of this study. Also, to engage parents so that they are motivated to participate, incentives in the form of resources may be beneficial. Resources could include access to support groups, community advocates, or specialists that could provide free services. Introducing incentives at different points throughout the study may also encourage participants to complete the study.

Limitations. The brief time frame of only five sessions; paired with the relative long in-session time spent on parenting strategies of approximately 90 minutes per session; and that the fact that data collection occurred in the first 15 minutes of the session leaving no time for warm-up or reminders may have mitigated finding more specific session-by-session changes in behavior. Though this model was developed to be short-term originally, the short time frame did not work for the single-subject, multiple-baseline design. Ideally, there would have been more time to conduct additional baseline data points in sessions before the intervention sessions.

Conclusion. This thesis provides information on the session-by-session acquisition of parental skills using the PBVS curriculum. By using a single-subject multiple baseline design, we had hoped to follow parent behavior skill changes throughout the sessions; unfortunately, this was not the case. This study was successful, however, in demonstrating positive gains for multiple indicators including parental stress, knowledge, and perhaps most importantly, a decrease in their child's challenging behaviors. More research is needed on how to best teach

parental behavior skills in a way that encourages their use. It is also important to address the needs of the family in order to increase parent training outcomes.

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Appendix A

PBVS Observation Form

Session #:																						
Date:																						
Child's Initials:	0:00-0:30	0:30-1:00	1:00-1:30	1:30-2:00	2:00-2:30	2:30-3:00	3:00-3:30	3:30-4:00	4:00-4:30	4:30-5:00	5:00-5:30	5:30-6:00	6:00-6:30	6:30-7:00	7:00-7:30	7:30-8:00	8:00-8:30	8:30-9:00	9:00-9:30	9:30-10:00		
Observer:																						
Definition																						
Verbal – "Do Statements"																						
Verbal- "Don't Statements"																						
Verbal- Praise																						
Verbal-Prompt																						
Nonverbal- Gestures and Physical Prompts																						
Nonverbal- Provision of Visual Aids																						

Behavior Targeted for Reduction:	
Alternate Behavior Targeted for Increase:	

Target Behavior (Parent report: # of instances in past week)	
Alternate Behavior (Parent report: # of instances in past week)	

Session Notes:

Appendix B

Positive Behavior Support Self-Reported Knowledge Assessment

Please rate your level of confidence related to the following:

1. Identifying early child developmental milestones

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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2. Identifying signs of possible developmental delays

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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3. Discussing signs of developmental delays with others

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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4. Defining behaviors in observable/measurable terms

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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5. Identifying the time of day the behavior is most likely to occur

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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6. Identifying settings/locations where the behavior is most often occurring

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand
-----------------------------	------------------------	-------------------------	------------------------------	------------------------------

7. Identifying the most common trigger for the behavior

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand
-----------------------------	------------------------	-------------------------	------------------------------	------------------------------

the question

8. Identifying the most common family response to the behavior

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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9. Collecting behavior observation data

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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10. Understanding what a child is attempting to communicate through his/her behavior

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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11. Utilizing various prompts to teach a child new skills

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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12. Developing strategies to prevent problem behavior

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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13. Developing strategies to minimize reinforcement of child problem behavior

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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14. Identifying new forms of communication to teach the child

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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15. Developing strategies to reward appropriate behaviors

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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16. Implementing a behavior intervention in the home setting

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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17. Training others to implement a behavior intervention

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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18. Utilizing visual support tools to boost child communication

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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19. Utilizing visual support tools to improve child functioning during daily routines

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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20. Training others to utilize visual supports in the home

1 Very Low Confidence	2 Low Confidence	3 High Confidence	4 Very High Confidence	N/A I don't understand the question
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Appendix C

Parental Stress Scale

The following statements describe feelings and perceptions about the experience of being a parent. Think of each of the items in terms of how your relationship with your child or children typically is. Please indicate the degree to which you agree or disagree with the following items by placing the appropriate number in the space provided.

1 = Strongly disagree 2 = Disagree 3 = Undecided 4 = Agree 5 = Strongly agree

- ___ 1. I am happy in my role as a parent.
- ___ 2. There is little or nothing I wouldn't do for my child(ren) if it was necessary.
- ___ 3. Caring for my child(ren) sometimes takes more time and energy than I have to give.
- ___ 4. I sometimes worry whether I am doing enough for my child(ren).
- ___ 5. I feel close to my child(ren).
- ___ 6. I enjoy spending time with my child(ren).
- ___ 7. My child(ren) is an important source of affection for me.
- ___ 8. Having child(ren) gives me a more certain and optimistic view for the future.
- ___ 9. The major source of stress in my life is my child(ren).
- ___ 10. Having child(ren) leaves little time and flexibility in my life.
- ___ 11. Having child(ren) has been a financial burden.
- ___ 12. It is difficult to balance different responsibilities because of my child(ren).
- ___ 13. The behavior of my child(ren) is often embarrassing or stressful to me.
- ___ 14. If I had it to do over again, I might decide not to have child(ren).
- ___ 15. I feel overwhelmed by the responsibility of being a parent.
- ___ 16. Having child(ren) has meant having too few choices and too little control over my life.
- ___ 17. I am satisfied as a parent.
- ___ 18. I find my child(ren) enjoyable.

Scoring

To compute the parental stress score, items 1, 2, 5, 6, 7, 8, 17, and 18 should be reverse scored as follows: (1=5) (2=4) (3=3) (4=2) (5=1). The item scores are then summed.

Reference: Berry, J. O., & Jones, W. H. (1995). The Parental Stress Scale: Initial psychometric evidence. *Journal of Social and Personal Relationships*, 12, 463-472.