AN EVALUATION OF A TELEHEALTH PARENT TRAINING PROGRAM IN TEACHING SELF-CARE SKILLS TO CHILDREN WITH AUTISM

By

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Abstract

Although a fundamental component of effective behavioral intervention programs for children with autism spectrum disorder is parent involvement, parents are often unable to receive adequate parent training from qualified specialists (e.g., BCBAs) due to obstacles such as cost and geographic location. One way to address this issue is to utilize telehealth technology to remotely teach parents of children with autism to be effective behavioral teachers for their children. The present study used iPad minis, FaceTime videoconferencing technology, and wireless Bluetooth ear buds to remotely deliver a parent training program to three parents of children with autism in the family home. Using a behavioral skills training-based program, parents were taught to conduct preference assessments and implement a graduated guidance teaching program to teach their children several important self-care skills (washing face, washing hands, and applying lotion). Results indicated that all three parents were able to accurately conduct preference assessments with their children after only receiving detailed written instructions. Parents, however, did not correctly implement graduated guidance after only receiving detailed written instructions. After parents received our parent training package that included instructions, modeling, role-play, and feedback procedures delivered via FaceTime, all three parents were able to correctly implement graduated guidance teaching procedures with near-perfect levels of procedural fidelity. After parents learned to use graduated guidance to teach the first self-care skill, all three parents were able to correctly implement graduated guidance teaching procedures to teach their children other self-care skills after only receiving detailed written instructions that explained how to do so for each skill. Furthermore, parent-implemented graduated guidance was effective in increasing independent completion of self-care skills for all three child participants.

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An Evaluation of a Telehealth Parent Training Program To Teach Self-Care Skills To Children with Autism

The recently published fifth edition of *The Diagnostic and Statistical Manual of Mental Disorders* (5th ed.; *DSM–5*; American Psychiatric Association, 2013) described autism spectrum disorder (ASD) as a disorder that is marked by a) deficits in communication and social interaction and b) the presence of restricted or repetitive behaviors, activities, or interests. The Centers for Disease Control and Prevention (2014) recently reported that approximately one in every 68 children is diagnosed with ASD in the United States. This estimation reflects a 30% increase in the number of children diagnosed with ASD in the past two years and, in turn, the growing need for effective programs and services.

Researchers have demonstrated that early and intensive interventions that use the principles and procedures of applied behavior analysis, specifically Early Intensive Behavioral Intervention (EIBI), can be effective in teaching and treating children with ASD when implemented by trained specialists such as board certified behavior analysts (BCBAs) (Matson & Smith, 2008). Unfortunately, parents of children with ASD often experience substantial difficulty obtaining appropriate EIBI services for their children (Kogan et al., 2008) due to obstacles such as cost, lengthy waitlists, and geographic isolation (Stahmer & Gist, 2001; Symon, 2001; Koegel, Symon, & Koegel, 2005). Additionally, even when children with ASD are able to receive appropriate EIBI services, treatment gains often do not generalize from the clinical environment to the natural home (especially if children attend center-based EIBI programs). Furthermore, there are often unique issues (e.g., going to sleep, sleeping through the night, independently getting ready for bed, morning and evening routines) that need to be addressed in the family home with parents that may not be directly targeted in an EIBI

intervention program. One way to address these issues is to train parents of children with ASD to be effective behavioral teachers for their children. Furthermore, the National Research Council (NRC) suggested that a fundamental component of effective ASD intervention programs is parent involvement (NRC 2001).

There are a number of benefits to teaching parents to be involved in interventions for their children with ASD. First, Cordisco, Stain, and Depew (1988) demonstrated that parent training can successfully increase both parents' knowledge and ability to implement behavior management programs with their children. Second, parent involvement in ASD interventions may help promote the generalization and maintenance of child skills (Koegel, Schreibman, Bitten, Burke, & O'Neil, 1982). Third, parent involvement is often more cost-effective than a purely therapist-based treatment intervention (Ingersoll & Gergans, 2007). Fourth, parent training and involvement can reduce parental stress related to caring for a child with ASD (Koegel, Bimbella, & Schriebman, 1996) and increase parent optimism and reported leisure time (Koegel et al., 1982). Finally, Connell, Sanders, and Markie-Dadds (1997) found that parent training increases parents' reported sense of competence related to their parental abilities.

There is a large body of literature dating back to the late 1960s and 1970s that supports the practice of teaching parents to implement behaviorally-based programs with their children. Researchers have demonstrated that parents can be taught to successfully implement a variety of behavioral procedures with their children including positive reinforcement procedures, time-out, prompting procedures, and shaping (e.g., Williams, Williams, & McLaughlin, 1991) both in the family home (e.g., Dachman, Halasz, Bickett, & Lutzker, 1984) and clinical settings (e.g., Bauman, Reiss, Rogers, & Bailey, 1983). Parents also have been successfully taught to address a variety of issues such as noncompliance (e.g., Baum & Forehand, 1981), aggressive behaviors

(e.g., Sallis, 1983), fear of the dark (e.g., Giebenhain & O'Dell, 1984), food refusal (e.g., Werle, Murphy, & Budd, 1993), seizures (e.g., Kiesel, Lutzker, & Campbell, 1989), conduct problems (e.g., Hughes & Wilson, 1989), hearing deficits (e.g., Forehand, Cheney, & Yoder, 1974), and language delays in children with developmental delays (e.g., Feldman et al., 1986; Feldman, Case, Rincover, Towns, & Betel, 1989) and autism (e.g., Laski, Charlop, & Schreibman, 1988).

Behavioral Parent Training for Parents of Children with Autism

One behavioral training method that is effective in teaching parents to implement behavioral programs with their children is behavioral skills training (BST). Miltenberger (2004) described BST as a teaching procedure that involves the use of four different procedures: instructions, modeling, rehearsal (or role-play), and feedback (pp. 240-243). Within parent training programs, BST often includes a combination of written or verbal instructions describing the skill, live or video modeling of the skill by the researcher or clinician, role-play exercises involving the parent and the researcher or clinician, and both positive and corrective feedback on parent demonstration of the skill. BST procedures have been used to teach parents of children with autism to implement a variety of interventions with their children including shaping and prompting procedures to teach new behaviors (e.g., Koegel, Glahn, & Nieminen, 1978); functional analyses (e.g., Stokes & Luiselli, 2008); function-based treatments to address problem behavior (e.g., Vollmer, Marcus, & LeBlanc, 1994; Tarbox, Wallace, & Tarbox, 2002; Kuhn, Lerman, & Vorndran, 2003; Robertson, Wehby, & King, 2013); the Early Start Denver Model (ESDM) to promote language and engagement in young children with ASD (e.g., Vismara, Young, Stahmer, Griffith, & Rogers, 2009); toilet training protocols (e.g., Kroeger & Sorensen, 2010); joint attention programs (e.g., Rocha, Schriebman, & Stahmer, 2007); discrete trial instruction (e.g., Lafaskis & Sturmey, 2007; Crockett, Fleming, Doepke, & Stevens, 2007); the

picture exchange communication system (PECS) (e.g., Ben-Chaabane, Alber-Morgan, & DeBar, 2009); and a variety of naturalistic behavioral interventions (e.g., natural language paradigm, milieu teaching, pivotal response teaching, reciprocal imitation training, embedded teaching, incidental teaching) that aim to increase child language and imitative behaviors during naturally occurring, everyday activities by incorporating techniques such as contingent imitation (e.g., imitating child vocalizations and actions), following the child's lead (e.g., letting the child choose the activities and toys with which the child and the parent engage), and linguistic mapping (e.g., providing a "running" commentary of parent and child behavior) (e.g., Laski, Charlop, & Schriebman, 1988; Kaiser, Hancock, & Nietfeld, 2000; Koegel, Symon, & Koegel, 2002; Symon, 2005; Ingersoll & Gergans, 2007; Kashinath, Woods, & Goldstein, 2006; Charlop-Christy & Carpenter, 2000).

Although research shows that parents of children with ASD can be taught to implement a variety of behavioral interventions with their children, it is often the case that parents are unable to receive adequate parent training from qualified professionals (e.g., BCBAs) to implement behavioral programs with their children due to obstacles such as geographic location and cost. For example, if parents live in rural areas, they may have difficulty obtaining services from a qualified parent-trainer (e.g., BCBA) who will come to their home to deliver in-home parent training, or the parents may have difficulty traveling to a clinical facility to obtain center-based parent training. Relatedly, there are often additional costs associated with the delivery of parent training services such as compensating a BCBA for driving to the family home to deliver in-home parent training or the cost of the parents' time and gas with respect to driving to a clinical facility to receive center-based parent training. One way to address these issues is to utilize

remote telehealth technology to teach parents of children with ASD to be effective behavioral teachers for their children.

The Use of Telehealth Technology

Telehealth (also called 'telemedicine' and 'telepractice') is the use of a variety of methods to provide critical health services to people who do not have direct access to the professionals who can provide these services. Telehealth technology includes the use of a variety of communication technologies, such as telephones, computers (e.g., email), internet-assisted videoconferencing (e.g., Skype, iChat, ooVoo), and videophones. Researchers have demonstrated that telehealth can be used to deliver a variety of professional services, such as assessment, diagnosis, intervention, and consultation (Duffy & Kirkley, 2004; Glueckauf et al., 2002; Singh & Pan, 2004; Symon 2001) in real-time and over a geographical distance (Dudding, 2009). Thus, telehealth has created possibilities for sharing critical health information efficiently and promptly among health professionals and between health professionals and clients that was not possible until recently.

Over the past 25 years, there has been a rapid expansion in the use of telehealth technology to provide health-related services to people who previously could not receive services primarily due to barriers such as geographical distance and cost. There also has been a growing interest in evaluating the effectiveness of telehealth technology, primarily in three health-related areas: medical services, mental health services, and speech, language, communication, and hearing services. For example, telehealth is being used to provide clients with a variety of medical services such as diabetes management, and treatments to increase patient self-care behaviors including medication adherence, exercise, and dietary adherence (e.g., Dansky et al., 2001; Mason et al., 2006; Friedman et al., 1996; Radhakrishnan & Jacelon, 2012); mental health

services such as diagnosis, assessments, and a variety of mental health interventions including treatments for depression, anxiety, smoking, and eating disorders (e.g., Elford et al., 2000; Nelson, Barnard, & Cain, 2003; O'Reilly et al., 2007; Cowain, 2001; Peterson et al., 2009; Shaikh et al., 2008); and speech, language, communication, and hearing services such as screenings and diagnostic procedures, and a variety of speech, language, communication treatments including alaryngeal speech and swallowing therapy, and programs for stuttering (e.g., Givens et al., 2003; Krumm, Ribera, & Klich, 2007; Palsbo, 2007; Swanepoel, Kockemoer, & Clark, 2010; Myers, 2005; O'Brian, Packman, & Onslow, 2008). Most of the studies that have used telehealth to deliver medical, mental health, or speech, language, communication, or hearing services have involved the use of either telephone or some type of videoconferencing technology (e.g., Skype, iChat, ooVoo).

Furthermore, professionals are using telehealth within these areas to teach service providers to utilize new skills and procedures with clients with whom they are in proximity. For example, telehealth is being used to teach rural health care providers to assess and treat issues such as child abuse, management and control of asthma, and feeding and communication problems (e.g., Wasem & Puskin, 2000); to train nursing students to correctly implement basic health assessments (e.g., correct stethoscope placement, correct placement to check pulse) (e.g., Berg, Wong, & Vincent, 2007); to improve the self-management support of out-of-the home caregivers of individuals with chronic heart failure (e.g., Piette et al., 2008); and to teach service providers in rural American Indian communities to deliver pain-management education to cancer patients (e.g., Haozous et al., 2012).

Professionals are also using telehealth technology to train service providers to implement procedures to assess and treat children with ASD. For example, telehealth is being used to guide

teachers through the implementation of functional analysis procedures (Barretto, Wacker, Harding, Lee, & Berg, 2006; Machaliecek et al., 2009a; Machaliecek et al., 2013); train teachers and therapists to implement behavioral interventions such as functional communication training (Gibson, Pennington, Stenhoff, & Hopper, 2010) and the ESDM (Vismara, Young, Stahmer, Griffith, & Rogers, 2009); teach teachers to conduct preference assessments in special education classrooms (Machaliecek et al., 2009b); and assist teachers in the development and implementation of individualized education plans (Rule, Salzberg, Higbee, Menlove, & Smith, 2006).

The majority of studies that used telehealth to educate or train service providers, however, did not directly measure client or provider behavior (e.g., Wasem & Puskin, 2000; Berg, Wong, & Vincent, 2007; Piette et al., 2008) and, instead, relied primarily on indirect or self-report measures (e.g., interviews, rating scales). Therefore, it is not clear how effective these telehealth training programs were in producing meaningful changes in client or provider behavior.

The Use of Telehealth in Parent Training

Recently, a number of researchers have demonstrated that telehealth can be used successfully to teach parents to implement new skills with their children (e.g., McDuffie et al., 2013; Reese, Slone, & Soares, 2012; Kelso, Fiechtl, Olsen, & Rule, 2009; Baharav & Reiser, 2010; Antonioni et al., 2012; Olsen, Fiechtl, & Rule, 2012; Wacker et al., 2013a; Wacker et al., 2013b; Vismara, Young, & Rogers, 2012; Vismara, McCormick, Young, Nadhan, & Monlux, 2013; Wade, Oberjohn, Burkhardt, & Greenberg, 2009; Wade et al., 2012; McCullough, 2001). (For a comprehensive review of the use of telehealth in parent training, see Appendix A.) Several of these studies involved teaching parents to conduct assessment and treatment

procedures to address their children's problem behavior (e.g., Wacker et al., 2013a; Wacker et al., 2013b, Suess et al., 2014).

Wacker et al. (2013a), for example, tested the effectiveness of telehealth in teaching 20 parents of children with ASD who displayed problem behavior to implement functional analyses (FA). Using written and oral instructions along with remote coaching procedures, behavior analysts taught parents to conduct FAs with their children at a regional clinic. The behavior analysts were located at a different facility and coached parents to implement FA procedures using computers, web cameras, and audio headsets. Results from this study indicated that all 20 parents were able to implement FA procedures with high levels of integrity (i.e., over 95%) and identify the environmental variables that maintained problem behavior for 18 of the 20 children. A limitation to this study, however, is that parents conducted all procedures in a regional clinic; it is unknown if they would have been as successful implementing FAs if procedures had been conducted in the natural environment (e.g., family home). Additionally, data on parent implementation of FAs were collected only during the midpoint of the FA; no baseline data were collected on parent implementation of FAs. Thus, the effects of the telehealth intervention and remote coaching on parent implementation of FAs is unclear because the fidelity with which parents implemented FAs prior to parent training is unknown. Additionally, although the authors evaluated the effects of parent-implemented FAs on child problem behavior within a multielement design and, therefore, provided a convincing demonstration of experimental control of FA procedures, the effects of the telehealth parent training intervention on parent implementation of FAs was not evaluated within an experimental design (e.g., multiple baseline design). As a result, there was not a convincing demonstration of experimental control of the parent training procedures.

Although three telehealth parent training studies focused on teaching parents to address their children's problem behavior, the majority of telehealth parent training studies involved teaching parents to implement programs aimed at increasing their children's social or communication behaviors (e.g., McDuffie et al., 2013; Reese, Slone, & Soares, 2012; Kelso, Fiechtl, Olsen, & Rule, 2009; Baharav & Reiser, 2010; Antonioni et al., 2012; Olsen, Fiechtl, & Rule, 2012; Vismara, Young, & Rogers, 2012; Vismara, McCormick, Young, Nadhan, & Monlux, 2013; Wade, Oberjohn, Burkhardt, & Greenberg, 2009; Wade et al., 2012; McCullough, 2001). Surprisingly, only three of these studies directly measured and reported the effects of the telehealth parent training intervention on both parent and child behavior (Vismara, Young, & Rogers, 2012; Vismara, McCormick, Young, Nadhan, & Monlux, 2013; McDuffie et al., 2013).

Vismara, McCormick, Young, Nadhan, and Monlux (2013), for example, used written and oral instructions, video modeling, and remote coaching procedures to teach eight parents of children with ASD to implement three skills (increasing parent-child engagement, promoting children's functional verbal language, and increasing joint attention initiations) from the parent model of the ESDM. The authors collected data on parent implementation of skills (measured using a 5-point Likert scale with "1" being "no competent teaching" and "5" being "extremely competent teaching") and child social and communicative behaviors (i.e., functional verbal utterances and nonverbal joint attention initiations) across baseline, intervention, and follow-up (i.e., three, monthly follow-up sessions) using a multiple baseline across participants design. Results from this study indicated that parents' fidelity of program intervention implementation increased (i.e., mean fidelity rating at baseline = 2.93, mean fidelity rating following the intervention = 3.68) following the parent training intervention and remained at high levels throughout the study and at follow-up (i.e., mean fidelity rating at follow-up = 4.15). Unlike

previous studies that assessed the effectiveness of parent-implemented and therapist-implemented ESDM procedures on the rate of child functional verbalizations (e.g., Vismara et al., 2009; Vismara et al., 2012) and found substantial increases in child functional verbalizations following the intervention, results from this study indicated that the rate of child functional verbal utterances (i.e., mean rate of vocalizations at baseline = 2.97, mean rate of vocalizations following the intervention = 3.60) increased slightly after parent implementation of P-ESDM procedures. Interestingly, although the mean rate of functional verbal utterances increased at follow-up (i.e., mean rate of vocalizations at follow-up = 4.14), the rate of functional verbal utterances appeared to decrease at follow-up for some children. Additionally, the rate of joint attention initiations did not increase following the intervention (i.e., mean rate of joint attention initiations at baseline = 1.67, mean rate of joint attention initiations following the intervention = 1.67) yet appeared to increase slightly at follow-up (i.e., mean rate of joint attention initiations at follow-up = 2.16). No studies have assessed the effectiveness of ESDM procedures on increasing child joint attention initiations; thus, it is unknown whether the lack of substantial changes in child joint attention initiations is a result of the ESDM procedure itself or other unknown variables. Overall, the authors clearly demonstrated that the telehealth parent training intervention was effective in teaching parents to implement the ESDM intervention with their children, yet the effectiveness of the parent-implemented ESDM intervention on improving child behavior was less clear.

The majority of telehealth parent training studies used some form of BST (i.e., some combination of instructions, modeling, role-play, and feedback) to teach parents to implement new skills with their children. Although research regarding the necessary and sufficient components of BST is mixed, a number of studies have found that written instructions alone are

not effective in teaching individuals to correctly and consistently implement new skills (e.g., Ducharme & Feldman, 1992; Gardner, 1972; Ward-Horner & Feldman, 2012). Rather, several researchers have concluded that feedback and perhaps modeling appear to be the most effective BST components (e.g., Feldman, Case, Rincover, Towns, & Betel, 1989; Krumhus & Malott, 1980; Hudson, 1982). Interestingly, however, a recent study by Graff and Karsten (2012) found that providing teachers with "enhanced" written instructions could effectively teach the teachers to implement stimulus preference assessments with children with ASD (Graff & Karsten, 2012). Specifically, the authors compared the effectiveness of written instructions alone, written instructions with a data sheet, and enhanced written instructions in teaching teachers to conduct two types of stimulus preference assessments. The written instructions alone consisted of the methods section from the published articles for each type of preference assessment. The written instructions with data sheet consisted of the methods section from published articles for each preference assessments as well as a detailed data sheet for teachers to complete while conducting the preference assessments. The enhanced written instructions consisted of jargon-free, step-by-step instructions, a detailed data sheet, and diagrams that detailed how to conduct the preference assessments. These authors found that only the enhanced written instructions were effective in teaching teachers to correctly conduct stimulus preference assessments. Even though the results of this study suggest that user-friendly, jargon-free, detailed written instructions may be an effective and efficient training tool that can be used to teach individuals to implement some types of skills (e.g., preference assessments), more research is needed to further investigate the range of skills that can be taught using a similar type of "detailed written instructions." If effective, detailed written instructions may be able to be used within telehealth parent training programs alone or in concert with other BST components (e.g., model, role-play, feedback) to more

effectively and efficiently teach parents. Currently no studies have been conducted to examine the effectiveness of detailed written instructions in teaching parents.

In general, studies that have used telehealth methods to teach parents to implement new programs with their children seem to support the effectiveness of telehealth parent training programs in teaching parents. Currently, however, no studies have used telehealth to teach parents to target deficits their children may have in multi-step, self-care skills (e.g., washing hands, washing face, applying lotion). This is an important area to address within parent training programs due to the fact that many children with ASD exhibit pronounced deficits in self-care skills (Flynn & Healy, 2012). Deficits in these skills can hinder a child's integration into daycare or school settings and result in a greater reliance on parents to help children complete these necessary skills on a daily basis (Jasmin, Couture, Fombonne, & Gisel, 2009). Additionally, no studies have looked at using telehealth to teach parents to implement a graduated guidance prompting procedure which is commonly used to teach children with ASD to independently complete self-care skills.

The purpose of the current study was to develop and evaluate an effective parent training program, that did not require in-person (i.e., in-vivo) training, to teach parents of children with ASD to implement a preference assessment and a graduated guidance teaching procedure to teach their children to independently complete three important self-care skills (i.e., washing hands, washing face, and applying lotion). The first purpose was to determine if detailed written instructions would be sufficient to teach parents to implement each procedure. If detailed instructions were not sufficient, the second purpose was to determine if a parent training package delivered through telehealth technology, using iPad minis, FaceTime videoconferencing technology, and wireless Bluetooth ear buds, could be used to teach parents to implement each

procedure with acceptable levels of fidelity and concurrently produce positive changes in child behavior.

Method

Participants, Setting, and Materials

The primary investigator recruited three children with ASD and their parents (i.e., three parent-child dyads) to participate in this study. The children were participating in an EIBI program that serves children with ASD that is located at a Midwestern university. To participate in this study, families had to meet the following criteria: (1) children had an ASD diagnosis from an independent agency; (2) children were between the ages of three-and five-years-old; (3) at least one parent was available to participate in two to three, 15-min sessions per week for the duration of the study; (4) another adult (e.g., other parent, older sibling, neighbor, babysitter) was available to participate in several role-play sessions throughout the study; and (5) the family home was equipped with a wireless router and a high-speed Internet connection (i.e., at least one gigabyte/second upload and download) for the duration of the study. Informed consent was obtained from each child's parent or legal guardian prior to participation, and the university's institutional review board reviewed and approved the procedures used with the participants in the research. One parent (referred to as the teaching parent) from each parent-child dyad was selected to conduct preference assessments and teach self-care skills; the other parent is referred to as the non-teaching parent.

Jesse was a 5-year-old boy diagnosed with ASD who had received an average of 35 hours a week of discrete-trial EIBI therapy for the past 16 months. Jesse's behavioral programming focused on building pre-academic skills (e.g., prepositions, quantitative concepts, cutting, tracing), increasing verbal behavior (e.g., requesting, expressive labeling, asking and answering

questions, reading sight words), learning compliance skills (e.g., "stop" and "wait"), and increasing appropriate play and social skills (e.g., engaging in independent play and appropriately playing with peers). An Assessment of Basic Learning and Language Skills (ABLLS) that was conducted at his center-based EIBI program prior to the beginning of the current study indicated that Jesse was demonstrating 58% of all assessed skills (e.g., receptive language, motor imitation, vocal imitation, reading, math, dressing, eating, grooming, gross motor, fine motor). More specifically, Jesse was demonstrating 71% of grooming skills, 90% of gross motor skills, and 89% of fine motor skills. Jesse's mother was the teaching parent in this study. At the beginning of the study, Jesse's mother was 36 years old, had completed some college, and did not have any prior experience implementing preference assessments, discrete trial instruction, or graduated guidance teaching procedures. Jesse's mother was married and had a full-time job outside of the family home.

Bobby was a 4-year-old boy diagnosed with ASD who had received an average of 35 hours a week of discrete-trial EIBI therapy for the past 13 months. Bobby's behavioral programming focused on building pre-academic skills (e.g., prepositions, quantitative concepts, cutting, tracing), increasing verbal behavior (e.g., requesting and expressive labeling), increasing imitation skills (e.g., verbal imitation, gross motor imitation, object imitation), learning compliance skills (e.g., "stop" and "wait"), and increasing appropriate play and social skills (e.g., engaging in independent play and appropriately playing with peers). An Assessment of Basic Learning and Language Skills (ABLLS) that was conducted at his center-based EIBI program prior to the beginning of the current study indicated that Bobby was demonstrating 35% of all assessed skills (e.g., receptive language, motor imitation, vocal imitation, reading, math, dressing, eating, grooming, gross motor, fine motor). More specifically, Bobby was

demonstrating 86% of grooming skills, 83% of gross motor skills, and 75% of fine motor skills. Bobby's mother was the teaching parent in this study. At the beginning of the study, Bobby's mother was 34 years old, had completed her bachelor's degree, and did not have any prior experience implementing preference assessments, discrete trial instruction, or graduated guidance teaching procedures. Bobby mother was married and had a full-time job outside of the family home.

Laura was a 5-year-old girl diagnosed with ASD who had received an average of 35 hours a week of discrete-trial EIBI therapy for the past 11 months. Laura's behavioral programming concentrated on building pre-academic skills (e.g., matching and receptive labeling), increasing imitation skills (e.g., gross motor imitation and object imitation), learning compliance skills (e.g., receptive instructions and "my turn, your turn"), decreasing problem behaviors (e.g., tantruming and aggression), and increasing appropriate play skills (e.g., completing puzzles and using shape sorters). Laura had some expressive language, mostly one-word requests for food or preferred items (e.g., toys). An Assessment of Basic Learning and Language Skills (ABLLS) that was conducted at her center-based EIBI program prior to the beginning of the current study indicated that Laura was demonstrating 4% of all assessed skills (e.g., receptive language, motor imitation, vocal imitation, reading, math, dressing, eating, grooming, gross motor, fine motor). More specifically, Laura was demonstrating 0% of grooming skills, 13% of gross motor skills, and 21% of fine motor skills. A functional analysis had also recently been conducted at Laura's EIBI program to determine the function of Laura's aggressive behaviors. Results from this assessment indicated that the function of Laura's aggression appeared to be escape from non-preferred tasks. Laura's mother was the teaching parent in this study. Laura's mother was 30 years old, had completed her master's degree, and

did not have any prior experience implementing preference assessments, discrete trial instruction, or graduated guidance teaching procedures. Laura's mother was also married and had a full-time job outside of the family home.

All teaching sessions and observations took place in the participants' homes. The primary investigator conducted all sessions using FaceTime videoconferencing technology on password-protected iPad minis that allowed investigators and parents to see, hear, and communicate with each other in real time. Each parent received an iPad mini and Otterbox iPad case that also functioned as a stand for the iPad. During preference assessments, parents placed the iPad on its stand on the kitchen table pointed toward the parent and child. During graduated guidance teaching sessions, parents placed the iPad on its stand near the bathroom sink or on the top of the back of the toilet pointed towards the parent and child who were standing in front of the bathroom sink. Additionally, to ensure that only the teaching parent (rather than both the teaching parent and the child) heard the primary investigator's instructions and feedback during sessions, teaching parents were provided with Jabra Bluetooth ear buds to wear during all FaceTime sessions. In order to evaluate treatment fidelity, the primary investigator also used a video camera, mounted on a tripod facing the investigator's iPad, to record all FaceTime sessions and her implementation of all parent training procedures.

Skill Areas

The primary investigator first taught parents to implement a preference assessment similar to the multiple stimulus without replacement preference assessment (MSWO; adapted from DeLeon & Iwata, 1996). The primary investigator next taught parents to implement a graduated guidance teaching procedure to teach their children to independently complete three

self-care skills: washing face, washing hands, and applying lotion to hands and face (see Appendix B for the task analyses of the self-care skills).

Dependent Variables and Data Collection

All FaceTime sessions were video recorded and scored for parent behavior and child behavior.

Parent behavior. Parent behavior included scoring the correct implementation of the preference assessment and graduated guidance teaching procedures for all three parents using parent behavior checklists (see Appendix C and Appendix D for parent behavior checklists). The preference assessment procedure had eight parent behavior steps; the primary investigator scored the parent's correct implementation of each step for each preference assessment that was completed by the parent. The graduated guidance teaching procedure had 13 parent behavior steps; the primary investigator scored the parent's correct implementation of each step for each graduated guidance teaching trial that was completed by the parent. For both procedures, if the parent implemented a step correctly, she would receive a "yes" for that step. If the parent omitted a step or did not correctly implement a step, she would receive a "no" for that step. The parent could also receive a score of "non applicable" for a step based on whether the step needed to be implemented. For example, if the child correctly completed all the self-care skill steps without engaging in problem behavior during a graduated guidance teaching trial, the step related to "returning to the previous prompt level for the remaining skill steps if the child makes an error or displays problem behavior" would be scored as "not applicable."

For each preference assessment and graduated guidance teaching session, the percentage of parent behavior steps correctly completed by the parent was calculated by dividing the total number of parent behavior steps correctly completed by the total number of applicable steps.

This number was then multiplied by 100 to get the percentage of parent behavior steps correctly completed by the parent.

The primary investigator also taught one teaching parent, Laura's mother, to implement constant time delay probe trials within the graduated guidance teaching sessions to better assess Laura's progress in learning each self-care skill. Thus, for Laura's mother, the primary investigator also scored the correct implementation of the constant time delay probe trial steps. This procedure had five parent behavior steps; the primary investigator scored Laura's mother's correct completion of each step for each constant time delay trial using a parent behavior checklist (see Appendix E for parent behavior checklist). If Laura's mother implemented a step correctly, she received a "yes" for that step. If Laura's mother omitted a step or did not correctly implement a step, she received a "no" for that step. Laura's mother also received a score of "non applicable" for a step based on whether the step needed to be implemented. For each constant time delay probe trial, the percentage of parent behavior steps correctly completed by Laura's mother was calculated by dividing the total number of parent behavior steps correctly completed by the total number of applicable steps. This number was then multiplied by 100 to get the percentage of parent behavior steps correctly completed by Laura's mother.

Child behavior. Child behavior involved scoring the correct independent completion of self-care skill steps and the percentage of self-care skill steps during which the child displayed problem behavior. Of the three child participants, only Laura displayed problem behavior during sessions (see Appendix F for operational definitions of Laura's problem behavior). For each self-care skill step, a "+" was recorded if the child correctly and independently completed the skill step and a "-" was recorded if the child did not correctly and independently complete the step (e.g., was prompted through the step, incorrectly completed the step, omitted the step).

Additionally, for each self-care skill step, a "yes" was recorded if the child displayed problem behavior during the skill step, and a "no" was recorded if the child did not display problem behavior during the skill step. All child behavior was scored using a trial-by-trial data sheet (see Appendix G).

For each graduated guidance teaching session (and constant time delay probe trial for Laura), the percentage of self-care skill steps correctly and independently completed by the child was calculated by diving the number of self-care skill steps correctly and independently completed by the child by the total number of self-care skill steps and multiplying by 100. Additionally, for each graduated guidance teaching session (and constant time delay trial for Laura), the percentage of self-care skill steps that contained problem behavior was calculated by dividing the number of self-care skill steps during which the child displayed problem behavior by the total number of self-care skill steps and multiplying by 100.

Interobserver Agreement

Interobserver agreement was evaluated on at least 30% of all sessions. The primary investigator served as the primary data collector for all measures. A second observer independently scored data from the videotapes for at least 30% of all sessions. To evaluate reliability, the observer's data was compared to data recorded by the primary investigator.

To assess interobserver agreement on the implementation of the preference assessment procedures and graduated guidance teaching procedures for all three parents, a point-by-point comparison was conducted for each behavioral step on the preference assessment parent behavior checklist and the graduated guidance parent behavior checklist. The percentage of agreement for parent behavior was calculated was dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. The overall percentage of

agreement for preference assessment parent behavior across all parents was 98.7% (range across sessions 88.0%-100%). The overall percentage of agreement for graduated guidance parent behavior across all parents was 98.0% (range across sessions 86.5%-100%).

To assess interobserver agreement on the implementation of constant time delay probe trial steps by Laura's mother, a point-by-point comparison was conducted for each behavioral step on the constant time delay parent behavior checklist. The percentage of agreement for parent behavior was calculated was dividing the number of agreements by the number of agreements plus disagreements and multiplying my 100. The overall percentage of agreement for constant time delay parent behavior was 100%.

To evaluate interobserver agreement for child correct and independent completion of self-care skill steps and the occurrence of problem behavior during self-care skill steps (for Laura), a point-by-point comparison was conducted for each self-care skill step. The percentage of agreement for child behavior was calculated was dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100. The overall percentage of agreement for child correct and independent completion of skill steps across all children was 99.0% (range across sessions 85.7%-100%). The overall percentage of agreement for child problem behavior for Laura was 99.1% (range across sessions 95.0%-100%).

Treatment Integrity

To assess treatment integrity, the primary investigator recorded her implementation of the BST graduated guidance parent training package procedures (i.e., graduated guidance teaching overview and oral quiz, model, parent role-plays with adult and receives immediate feedback, parent implements with child and receives immediate feedback, parent implements with child and receives delayed feedback) for all BST graduated guidance parent training package sessions

using investigator checklists (see Appendices H-K for investigator treatment integrity checklists). The primary investigator also recorded her implementation of the constant time delay training procedures (for Laura's mother) for all constant time delay parent training sessions using an investigator behavior checklist (see Appendices L-N for investigator treatment integrity checklists). For both procedures, treatment integrity was calculated by dividing the number of steps implemented correctly by the number of correct plus incorrect steps and multiplying by 100. The primary investigator reported that she implemented the BST graduated guidance parent training package procedures and constant time delay parent training procedures with 100% fidelity across all parent training sessions and participants. A second observer independently scored the primary investigator's behavior for at least 30% of all parent training sessions. Interobserver agreement was calculated by comparing the two records and examining each step of investigator behavior, totaling the number of agreements (i.e., trials in which the primary investigator and observer recorded the same investigator behavior), dividing the number of agreements plus disagreements (i.e., trials in which the primary investigator and observer recorded different investigator behavior), and multiplying by 100 to obtain a percentage of agreement. Results indicated that the second observer agreed on 100% of all trials with the primary investigator's recording of her own behavior.

Experimental Design

A multiple baseline design (Baer, Wolf, & Risley, 1968) across parent-child dyads was used to evaluate the effectiveness of the parent training program in teaching parents to conduct preference assessments. A multiple baseline design across self-care skills was used to evaluate the effectiveness of the parent training program in teaching parents to implement graduated guidance to teach three self-care skills (i.e., washing face, washing hands, applying lotion).

Initial Parent Assessment Questionnaire Regarding Child Skills

To determine which self-care skills would be taught to each parent-child dyad, an assessment questionnaire was distributed to all parents (i.e., all teaching and non-teaching parents) that asked them to individually rate their satisfaction with their child's ability to demonstrate a number of skills and how important they believed it was for their child to learn or address each skill (see Appendix O for parent intake assessment questionnaire). Parents rated their satisfaction with their child's ability to perform each skill on a 5-point Likert scale with "0" being "not at all satisfied" and "4" being "very satisfied." Similarly, parents rated the importance of their child learning each skill on a 5-point Likert scale with "0" being "very unimportant" and "4" being "very important." The results of the assessment questionnaire indicated that all parents reported low satisfaction with their children's ability to independently wash their hands, wash their face, and put on lotion. Additionally, all parents reported high importance with respect to their children independently completing these self-care skills. None of these self-care skills were, or had been, directly taught as part of the children's EIBI intervention program.

Preference Assessment

The teaching parents were first taught to conduct a preference assessment similar to the MSWO (multiple stimulus without replacement) (adapted from DeLeon & Iwata, 1996) to identify several preferred edible items to be used as reinforcers for her child during teaching. The teaching parent was taught to implement the following steps when conducting a preference assessment with her child: 1) gather at least five different edible items that the child enjoys and make sure each item is smaller than the size of a quarter; 2) present the five edible items in a straight line and approximately two inches apart; 3) ask the child to pick an item he or she wants

by saying, “Pick one;” 4) block any attempts by the child to choose more than one item; 5) remove the item the child chooses, allow him or her to consume the item, and do not replace the item; 6) take the item at the left end of the line and move it to the right end; 7) shift the remaining items so that they are evenly spaced approximately two inches apart; 8) repeat steps 3-7 until all items have been selected or the child does not make a selection within 30 s of the parent asking them to do so. The teaching parent was instructed that if, at any time during the preference assessment, the child does not make a selection within 30 s, then they should remove all items and end the assessment.

The teaching parent was taught to conduct five preference assessments with her child across five different days using the same five edible items each time. The teaching parent also filled out a data sheet that was provided by the primary investigator each time she conducted a preference assessment. After the teaching parent successfully completed five preference assessments, she was asked to choose all the edibles that her child selected first during the preference assessments to be used as reinforcers during teaching sessions. If the child selected the same item first during all five preference assessments, the teaching parent was instructed to also include any items the child chose second. The teaching parent was instructed to store the chosen edibles in an area that the child could not reach and ensure that the chosen edibles were only available to the child during teaching sessions.

Graduated Guidance Teaching Procedure

After each teaching parent successfully completed five preference assessments with her child, the primary investigator taught the teaching parents to implement a graduated guidance teaching procedure to teach her child to independently compete self-care skills. The teaching parent taught her child one self-care skill at a time, and each teaching session consisted of the

teaching parent asking her child to complete the self-care skill currently being taught five times (i.e., five teaching trials per teaching session). The teaching parent was taught to begin the teaching of each self-care skill by using as little pressure as possible to physically guide the child through each step of the skill. The levels for gradually removing the physical prompts from the most controlling to the least controlling were as follows: (1) initially, the teaching parent used hand-over-hand, full physical prompts to gently guide the child through each step of the skill; (2) the teaching parent used partial physical prompts by using only her thumb and index finger to gently guide the child through each step of the skill; (3) the teaching parent used shadow prompts by "shadowing" the child's hands within approximately one inch for each step of the skill; finally, (4) the teaching parent presented only the initial instruction to compete the skill. Once the teaching parent was able to completely remove her physical prompts and the child was able to correctly and independently complete at least 90% of the self-care skill steps for three consecutive sessions, training for the skill ended. The teaching parent was instructed that, for future sessions, she should only ask her child to complete the skill one time.

The teaching parent began teaching each skill by using hand-over-hand physical prompts and decreased the amount of prompting one level when the child correctly completed the skill for three consecutive trials. Correct skill completion was defined as the child (a) correctly performing all steps of the skill either by himself or herself or with the parent's help and (b) not engaging in any problem behaviors during the skill. If the child did not correctly complete a skill step or engaged in problem behavior at any level of prompting, the parent was instructed to return to the previous level of prompting and remain at that level until the child achieved the criterion of three consecutive correct trials. Correct skill step completion was defined as the child a) correctly performing the skill step either by himself or herself, or with their parent's help

and b) not displaying any problem behaviors during skill step. If the child attempted to pull away, protest, or resist the physical prompts, the teaching parent was instructed to remain calm and continue to physically prompt the child though the skill.

The teaching parent was also instructed to provide verbal praise (e.g., "Great job," "Awesome!") for *each* correctly completed skill step during teaching sessions. If the child did not correctly complete a skill step (e.g., incorrectly completed a step, omitted a step, displayed problem behavior during a step), the teaching parent was instructed to not provide verbal praise following that self-care skill step. Additionally, each time the child correctly competed *all* the steps of a skill, the teaching parent was taught to provide verbal praise (e.g., "Great job," "Way to go!"), physical touches (e.g., back rubs, high fives, hugs), and one serving of the child-selected edible reinforcer. If the child did not correctly complete all the steps of a skill (e.g., incorrectly completed a step, omitted a step, displayed problem behavior during a step), the teaching parent was instructed to not provide verbal praise, physical touches, or one serving of the child-selected edible reinforcer following the completion of the self-care skill. For each session, the teaching parent began teaching using the level of physical prompt that she ended on in the previous teaching session (e.g., if the teaching parent ended on using full physical hand-over-hand prompts in session one then she began teaching using full physical hand-over-hand prompts in session two).

The teaching parent was taught to implement the following steps during each teaching session that she used graduated guidance to teach her child a self-care skill: 1) present at least two different pieces of the child's preferred edibles that the child chose first during the five preference assessments; 2) ask the child to pick what edible he or she wanted to work for; 3) put five pieces of the edible the child chose into a small container; 4) bring the child into the

bathroom; 5) close the bathroom door; 6) give the child the correct instruction (e.g., "Please wash your hands"); 7) implement the appropriate level of prompt for all steps of the skill (e.g., last level of prompt used in the previous teaching session or trial); 8) provide the appropriate consequence for each skill step (e.g., verbal praise each time the child correctly completed a skill step without problem behavior, with or without help from parent); 9) decrease the level of prompt one level when the child correctly completed each step of the skill (e.g., each skill step completed without problem behavior, with or without help from parent) three consecutive times; 10) provide appropriate consequence after completion of all steps of a skill (e.g., verbal praise, physical touches, and one serving of the child-selected edible if the child correctly completed all steps without problem behavior, with or without help from parent); 11) return to the previous prompt level for the remaining skill steps if the child makes an error (e.g., omitted a step, did not fully complete a step) or displays problem behavior; 12) remain calm and continue to prompt the child through the skill if the child attempts to pull away, protest, or resist the physical prompts; and 13) ask the child to complete the skill the correct number of times (e.g., five times if skill is currently being taught, one time if skill was already successfully taught).

Constant time delay probe trials. In order to better assess Laura's progress in learning self-care skills, the primary investigator taught Laura's mother to conduct a constant time delay probe trial prior to every third graduated guidance teaching session to assess self-care skill mastery. During delayed feedback graduated guidance teaching sessions for the first self-care skill, washing face, Laura's mother was implementing graduated guidance with near 100% fidelity, yet she was not able to successfully fade out her physical prompts due to either the occurrence of problem behavior or Laura consistently needing at least partial physical prompts to complete certain skill steps (e.g., pumping soap onto wash cloth, rinsing her face, turning off the

water). As a result, Laura did not have the opportunity to attempt to independently complete the skill. Thus, to better evaluate Laura's progress in learning how to independently complete this skill, Laura's mother was instructed to conduct a single constant time delay probe trial prior to every third graduated guidance teaching session to assess skill mastery. Laura's mother was instructed to use this additional assessment procedure for the remaining two self-care skills (i.e., applying lotion, wash hands) during all teaching phases (e.g., detailed written instructions, immediate feedback with child, delayed feedback with child).

During constant time delay probe trials, Laura's mother was told to give Laura the instruction to complete the skill (e.g., "Please wash your face"). She was then told to wait five s to determine if Laura would independently complete the first skill step (e.g., get wash cloth). If Laura did not independently complete the first skill step within five s of Laura's mother giving her the initial instruction or engaged in problem behavior, Laura's mother was instructed to deliver a full physical hand-over-hand prompt to help Laura complete the first skill step. Laura's mother was then told that after Laura independently completed the first skill step or after she helped Laura complete the first skill step, she should wait five s to determine if Laura would independently complete the next skill step (e.g., turn on water). Again, if Laura did not independently complete the second skill step within five s of completing the first skill step or engaged in problem behavior, Laura's mother was instructed to implement a full physical hand-over-hand prompt to help Laura complete the second skill step. Laura's mother was instructed to continue this procedure for each skill step (e.g., wet wash cloth, squeeze wash cloth, pump soap onto wash cloth, lift wash cloth to face, rub face for five s) until the entire skill was completed. During constant time delay probe trials, Laura's mother was instructed to praise Laura for each correctly completed skill step (i.e., steps completed with prompting or independently but without

problem behavior) and to deliver praise, physical touches, and one edible if Laura correctly completed all skill steps (i.e., all steps completed with prompting or independently but without problem behavior).

The primary investigator taught Laura's mother to implement the following steps each time she conducted a constant time delay probe trial: 1) give Laura the correct instruction (e.g., "Please wash your face"); 2) deliver a full physical prompt to help Laura complete each skill step that Laura does not complete within five s of the initial instruction or within five s of completing of the previous skill step; 3) deliver a full physical prompt to help Laura complete each skill step during which Laura displays problem behavior (e.g., throwing wash cloth, hitting parent, biting parent); 4) provide the appropriate consequence for each skill step (e.g., verbal praise each time Laura correctly completes a skill step without problem behavior, with or without help from parent); 5) provide appropriate consequence after the completion of all skill steps (e.g., provide verbal praise, physical touches, and one serving of the child-selected edible if the Laura correctly completes all steps without problem behavior, with or without prompts from the parent).

Parent Training Procedures

There were three primary stages in this study: general baseline, teaching parents to conduct a preference assessment, and teaching parents to implement the graduated guidance teaching procedure to teach self-care skills. Each stage involved several phases (e.g., baseline, detailed written instructions, BST parent training package which included intervention overview, model, role-play, immediate feedback, delayed feedback). All stages were completed using FaceTime and the iPad minis; no in-person training took place.

General baseline. During general baseline, the primary investigator gave the teaching parent no information about preference assessments or how to use graduated guidance teaching

procedures to teach her child self-care skills. The teaching parent received no feedback on her performance. Using general instructions (e.g., "Please ask your child to wash their hands and help them as you typically would"), the teaching parent was instructed to ask her child to complete each chosen self-care skill.

Teaching parents to conduct preference assessments. There were three potential phases in teaching parents to conduct preference assessments including baseline, detailed written instructions, and, if necessary, a BST parent training package.

Preference assessment baseline. The primary investigator asked the teaching parent to conduct a preference assessment by giving the following instruction, "Please conduct a preference assessment to identify some edible rewards for your child." The primary investigator did not give the teaching parent any feedback on her performance of the preference assessment.

Detailed written instructions for the preference assessment. The primary investigator gave the teaching parent detailed written instructions that explained how to conduct a preference assessment and data sheets to complete while conducting each preference assessment (see Appendix P). After receiving the detailed written instructions, the teaching parent was given the same instruction as in baseline, "Please conduct a preference assessment to identify some edible rewards for your child." The teaching parent did not receive any feedback on her performance of the preference assessment. If the teaching parent attempted to ask the primary investigator a question regarding the preference assessment procedures before or while she was conducting a preference assessment, the primary investigator told her, "Just do your best." If the teaching parent was able to conduct five preference assessments with her child across five days with at least 90% fidelity after receiving the detailed written instructions, then preference assessment training was considered complete and no further training was conducted. All three parents were

able to conduct five preference assessments with their children with 100% fidelity after receiving the detailed written instructions.

BST preference assessment parent training package. If parents had not been able to conduct five preference assessments with their children with at least 90% fidelity, the primary investigator would have delivered the following BST parent training package (described below) (see Appendices Q-S for investigator checklists for the BST preference assessment parent training package procedures).

Preference assessment overview. The primary investigator would have first described the preference assessment that was to be taught (e.g., "You will be conducting a procedure to identify edible items your child prefers to be used during teaching"). The primary investigator would have also provided rationales explaining to the teaching parent why it is important to conduct preference assessments (e.g., "If you identify edible items your child prefers, then he or she may be more willing to learn a skill you want to teach him or her if he or she get to receive a preferred edible item upon completing the skill"). Next, the primary investigator would have read the steps of completing the preference assessment aloud to the teaching parent. Finally, the primary investigator would have assessed the teaching parent's knowledge and understanding of preference assessment procedures by giving the teaching parent an oral quiz that would have involved asking her to answer aloud a series of questions regarding the implementation of the preference assessment procedure (see Appendix T). The teaching parent would have to answer all questions correctly to move on to the model phase.

Model. First, the primary investigator would have correctly modeled each step of the preference assessment procedure with a research assistant playing the role of the child. Next, the primary investigator would have correctly implemented five of the steps of the preference

assessment and incorrectly implemented three steps with the research assistant still playing the role of the child. A random number generator (http://www.random.org) would have been used to determine which three preference assessment steps would be incorrectly modeled. Following each demonstration, the primary investigator would have asked the teaching parent to state the steps that were correctly and incorrectly implemented by the primary investigator. Once the teaching parent could correctly identify all correct and incorrect steps, the teaching parent would begin to role-play his or her role.

Teaching parent role-plays with available adult and receives immediate feedback. The teaching parent would have role-played his or her role, an available adult volunteer (e.g., the non-teaching parent, neighbor, babysitter) would have role-played the role of the child, and the primary investigator would have "coached" the teaching parent through the implementation of the preference assessment by providing immediate positive and corrective feedback immediately following each parent behavior step. The feedback would have consisted of the researcher praising the parent for steps that were completed correctly (e.g., "Great job presenting five items," "Perfect job giving the correct instruction!") and correcting errors by giving corrective feedback (e.g., "Don't forget to block his/her attempts to choose more than one item," "Remember to let him/her consume each item he/she picks"). The teaching parent would have to successfully perform her role with no within-session corrective feedback three consecutive times (i.e., three consecutive preference assessments with no within-session corrective feedback) to move on to role-play with delayed feedback.

Teaching parent role-plays with available adult and receives delayed feedback. The teaching parent would have continued to conduct preference assessments with an available adult playing the role of the child. The primary investigator would have provided positive and

corrective feedback at the end of each preference assessment. The feedback would have consisted of the primary investigator praising the parent for steps that were completed correctly (e.g., "You did a great job giving him/her the correct instruction, removing and allowing him/her to eat each item he/she chose!") and correcting errors by giving corrective feedback for each error (e.g., "For the next preference assessment, make sure you move the item from the left end of the line to the right end of the line after he/she chooses each item"). Delayed feedback sessions would have been conducted until the teaching parent was able to correctly complete three consecutive preference assessments with no corrective feedback from the primary investigator.

Teaching parent conducts preference assessments with child. After the teaching parent had completed the BST preference assessment parent training package phase, the teaching parent would have been instructed to conduct five preference assessments with her child across five difference days. Each day, the primary investigator would have told the teaching parent to conduct a preference assessment to identify some rewards for her child. The teaching parent would not have received any positive or corrective feedback from the primary investigator on her implementation of the preference assessment unless she implemented preference assessment procedures with less than 90% fidelity; if the parent's fidelity of preference assessment procedures was below 90%, then the primary investigator would have delivered positive and corrective feedback following the completion of the preference assessment. The teaching parent would have been required to conduct five preference assessments with at least 90% fidelity to move on to learning to implement the graduated guidance procedure to teach self-care skills.

Teaching parents to implement the graduated guidance procedure to teach a skill. There were three potential phases in teaching parents to use graduated guidance to teach each

self-care skill including baseline, detailed written instructions, and, if necessary, a BST parent training package.

Graduated guidance baseline. The primary investigator told the teaching parent to use graduated guidance to teach her child to complete a self-care skill (e.g., "Please use graduated guidance to teach Laura to wash her face"). The teaching parent did not receive any feedback on his or her performance of the graduated guidance teaching procedure to teach the skill.

Detailed written instructions for the graduated guidance procedure. The primary investigator gave the teaching parent detailed written instructions that explained how to implement the graduated guidance teaching procedure to teach a skill (see Appendix U). The detailed written instructions also included a task analysis detailing the specific skill steps for the self-care skill (e.g., get wash cloth, turn on water, get wash cloth wet). The detailed written instructions were exactly the same for each self-care skill except for the specific task analysis detailing the steps for the self-care skill. After receiving the detailed written instructions, the teaching parent did not receive any feedback on her performance of the graduated guidance teaching procedure to teach the skill. The teaching parent was only told to use graduated guidance to teach her child to complete the self-care skill. If the teaching parent attempted to ask the primary investigator a question regarding the graduated guidance teaching procedures before or during graduated guidance teaching trials, the primary investigator told her to "just do your best." For each self-care skill, if the teaching parent was able to implement graduated guidance with her child across five consecutive sessions with at least 90% fidelity after receiving the written instructions *and* the child was able to correctly and independently demonstrate at least 90% of the skill steps for three consecutive graduated guidance teaching sessions, then training on the skill was considered complete and no further training on the skill was conducted.

BST graduated guidance parent training package. If the teaching parent was not able to implement graduated guidance with her child across five consecutive sessions with at least 90% fidelity after receiving the written instructions for a skill, or the child was not able to correctly and independently demonstrate at least 90% of the skill steps for three consecutive graduated guidance teaching sessions, then the primary investigator implemented the BST parent training package. The BST parent training package phase consisted of a graduated guidance teaching overview, modeling, role-play exercises, and immediate and delayed feedback procedures.

Graduated guidance teaching procedure overview. First, the primary investigator orally described the graduated guidance teaching procedure and the skill that was going to be taught (e.g., "You will be using graduated guidance to teach your child to independently was his/her face"). The primary investigator listed all of the skill steps from the task analysis for the self-care skill that was going to be taught. The primary investigator also provided rationales explaining to the teaching parent why it is important to teach their child the skill (e.g., "If we teach Laura to wash her face by herself, she will be able to do so when her face gets dirty and she will also be able to maintain good hygiene"). Then, the primary investigator read aloud the steps to using the graduated guidance procedure to teach the skill to the teaching parent. Finally, the primary investigator assessed the teaching parent's knowledge and understanding of the graduated guidance teaching procedure by giving the teaching parent an oral quiz that involved answering aloud a series of questions regarding the implementation of the graduated guidance procedure (see Appendix V). The teaching parent had to answer all questions correctly to move on to the model phase.

Model. After the teaching parent successfully passed the oral quiz, the primary investigator correctly modeled, with a research assistant playing the child, each of the 13 parent

behavior steps in using the graduated guidance prompting procedure to teach the skill. The primary investigator correctly modeled the 13 parent behavior steps for the entire graduated guidance teaching procedure (i.e., began teaching a skill by providing full physical hand-over-hand prompts for each skill step, faded to providing partial physical prompts, faded to providing shadow prompts, and ended teaching by providing no prompts). Next, the primary investigator correctly modeled nine parent behavior steps and incorrectly modeled four parent behavior steps with the research assistant still playing the role of the child. A random number generator (http://www.random.org) was used to determine which four graduated guidance steps were incorrectly modeled. Following each model, the primary investigator asked the teaching parent to state the steps that were correctly and incorrectly implemented by the primary investigator. The teaching parent had to correctly identify all steps that were correctly and incorrectly implemented by the primary investigator to move on the role-play phase.

Teaching parent role-plays with adult and receives immediate feedback. Once the teaching parent correctly identified all correct and incorrect steps, the teaching parent role-played the teaching parent's role, an available adult volunteer role-played the role of the child, and the primary investigator "coached" the teaching parent through her implementation of the entire graduated guidance teaching procedure by providing immediate and on-going positive and corrective feedback after each parent behavior step. The feedback consisted of the primary investigator praising the parent for steps that were completed correctly (e.g., "Great instruction," "Perfect hand-over-hand prompting!") and correcting errors by giving corrective feedback (e.g., "Don't forget to close the door", "Remember to deliver praise, physical touches, and an edible if Jesse correctly completes all the steps"). After the teaching parent role-played the entire graduated guidance teaching procedure *and* performed five consecutive graduated guidance

teaching trials with no corrective feedback from the primary investigator, the teaching parent began to implement the graduated guidance procedure with her child.

Teaching parent implements graduated guidance with child and receives immediate feedback. The teaching parent conducted graduated guidance teaching sessions with the child while the primary investigator provided ongoing positive and corrective feedback (coaching) on parent implementation of graduated guidance teaching procedures. This feedback was given immediately following each parent behavior skill step during teaching sessions using the same immediate feedback procedures that were used during the role-play phase. Immediate feedback sessions were conducted until the teaching parent was able to correctly conduct three consecutive graduated guidance teaching sessions (five skill trials per session) with no corrective feedback from the primary investigator.

Teaching parent implements graduated guidance with child and receives delayed feedback. The teaching parent continued to conduct graduated guidance teaching sessions with the child and the primary investigator provided positive and corrective feedback at the end of each teaching session (i.e., following the five teaching trials). The feedback consisted of the primary investigator praising the parent for steps that were completed correctly (e.g., "You did a great job giving Jesse the correct instruction and using shadow prompts to guide him through each step of the skill!") and correcting errors by giving corrective feedback for each error (e.g., "For our next session, make sure you are delivering a quick praise statement, such as 'super' or 'awesome,' each time Jesse correctly completes a skill step"). Delayed feedback sessions were conducted until the teaching parent was able to correctly complete three consecutive graduated guidance teaching sessions (five skill trials per session) with no corrective feedback from the primary investigator *and* the child was able to correctly and independently demonstrate at least

90% of the skill steps for three consecutive graduated guidance teaching sessions. After these criteria were met, baseline measures were taken on all yet-to-be-taught skills followed by the teaching parent beginning to teach the next self-care skill. These steps in teaching parents to implement the graduated guidance teaching procedure to teach a skill were repeated for each of the three self-care skills.

Constant time delay parent training. Laura's mother was taught to implement constant time delay probe trials (in addition to implementing graduated guidance teaching) through oral instructions, immediate feedback procedures, and delayed feedback procedures.

First, the primary investigator orally described the steps involved in conducting a constant time delay probe trial to Laura's mother. Next, the primary investigator instructed Laura's mother to conduct a constant time delay probe trial with Laura and provided her with ongoing positive and corrective feedback (coaching) on her implementation of the constant time delay probe trial procedures. This feedback was given following each parent behavior skill step during the constant time delay probe trial. The feedback consisted of the primary investigator praising Laura's mother for steps that were completed correctly (e.g., "Great job giving Laura the correct instruction," "Perfect job waiting five s for Laura to complete each step!") and correcting errors by giving corrective feedback (e.g., "Go ahead and use hand-over-hand prompts to guide her through that step because she's engaging in problem behavior"). Laura's mother continued to implement constant time delay probe trials and receive immediate feedback from the primary investigator until she was able to correctly implement three consecutive constant time delay probe trials for a skill with no corrective feedback from the primary investigator *and* Laura met a "modified mastery criterion" of correctly and independently completing at least 75% of skill steps during three consecutive immediate feedback constant time delay probe trials. The

mastery criterion was modified for Laura because the primary investigator and Laura's mother believed that the 90% mastery criterion level might be unrealistic for Laura to achieve.

If Laura did not meet the modified mastery criterion for a skill after three immediate feedback constant time delay probe trials (initially occurring prior to every third graduated guidance teaching session), then Laura's mother was instructed to conduct a constant time delay probe trial prior to *each* graduated guidance teaching session until the modified mastery criterion was met. After Laura met the mastery criterion for a skill during immediate feedback constant time delay probe trials, graduated guidance teaching sessions for the skill ended. Next, baseline measures were taken on all yet-to-be-taught skills followed by Laura's mother teaching the next skill.

Finally, to ensure that Laura's mother could implement constant time delay probe trials in the absence of immediate feedback, the primary investigator asked Laura's mother to implement constant time delay probe trials for a skill with the primary investigator providing positive and corrective feedback at the *end* of each constant time delay probe trial. The feedback consisted of the primary investigator praising Laura's mother for steps that were completed correctly (e.g., "You did a great job giving Laura the correct instruction, giving her five s to complete each skill step, praising each correctly completed step, and delivering praise, tickles, and an edible when she completed all skill steps without problem behavior!") and correcting any errors by giving a corrective feedback statement for each error (e.g., "Next time, make sure you are delivering a quick praise statement, such as 'super' or 'awesome,' each time Laura correctly completes a skill step"). Laura's mother continued to implement constant time delay probe trials and receive delayed feedback from the primary investigator until she was able to correctly implement three consecutive delayed feedback constant time delay probe trials with no corrective feedback from

the researcher *and* Laura correctly and independently completed at least 75% of skill steps during three consecutive delayed feedback constant time delay probe trials.

Post-training self-care skill probes.

After each parent-child dyad had completed training for the three self-care skills, all teaching parents conducted "post-training probe trials" to assess each child's performance of the self-care skills when parents simply told their children to complete each skill. During post-training probe trials, the teaching parent was instructed to 1) give her child the instruction to complete a self-care skill (e.g., "Please wash your face"); 2) ***not*** provide verbal praise for each correctly completed step; 3) ***not*** provide any type of physical prompts or assistance while the child completes the skill (even if the child incorrectly completes or omits a self-care skill step); 3) end the probe trial if the child engages in problem behavior ***or*** pauses for more than five s before they complete the skill; and 4) only provide verbal praise, physical touches, and an edible if the child completes the skill with no more than one incorrect or omitted skill step.

For each post-training probe trial, the percentage of skill steps that were independently completed by the child during that trial was calculated by dividing the number of skill steps the child correctly and independently completed (i.e., without requiring physical prompting) by the total number of skill steps and multiplying by 100. The primary investigator also scored parent implementation of post-training probe trials using a parent behavior checklist (see Appendix W) for each post-training probe trial and calculated the percentage of post-training probe parent behavior steps correctly completed by the parent by dividing the total number of parent behavior steps correctly completed by the total number of applicable steps. This number was then multiplied by 100 to get the percentage of post-training probe parent behavior steps correctly

completed by the parent. All teaching parents correctly completed 100% of post-training probe steps after receiving the oral instructions from the primary investigator.

Telehealth Cost Analysis

To assess the potential cost-savings of using telehealth to deliver the parent training intervention, the cost of delivering this parent training intervention via telehealth was compared to the cost of delivering this parent training intervention in-vivo (i.e., in-person). To conduct this analysis, it was assumed that parent training sessions would last approximately the same length of time when delivered via telehealth or in vivo. Thus, the additional costs associated with the parent-trainer traveling to the parents' homes to deliver the parent training intervention (i.e., in-vivo costs that included round-trip mileage reimbursement and round-trip travel time reimbursement) were compared to the cost of purchasing the telehealth technology equipment (i.e., telehealth costs that included an iPad mini, Otterbox iPad case, and Jabra Bluetooth ear bud). To compare the costs, the primary investigator excluded all baseline and written instructions in the cost analysis; only parent training sessions that required the primary investigator to deliver oral instructions, model procedures, or deliver feedback (i.e., BST graduated guidance training sessions, constant time delay probe trial training sessions, and post-training probe sessions) were included in the cost calculations.

The estimated costs associated with delivering the parent training program in-vivo were calculated by, first, totaling the round-trip mileage from the children's University-based EIBI program to the home of each family and multiplying by the low ($0.35 per mile) and high ($0.56 per mile) values of the range of mileage reimbursement rates offered in the area (The Council of State Governments Survey of State Government Websites, 2013). Next, the amount of time it would take for the primary investigator to travel to and from the University-based EIBI program

to each family's home (i.e., round-trip travel time) to deliver the parent training intervention was multiplied by the low ($28.85 per hr) and high ($38.46 per hr) values of the range of hourly compensation rates for BCBAs in the area (APBA Professional Employment Survey Results, 2009). Finally, those numbers were added together and multiplied by the total number of telehealth parent training sessions that were conducted for each parent-child dyad to obtain the total estimated low and high costs associated with delivering the parent training intervention in-vivo for each parent-child dyad.

The cost of the telehealth technology was calculated by adding the cost of the iPad mini (i.e., $299.00), the cost of the Otterbox Defender iPad mini case (i.e., $79.90), and the cost of the Jabra BT2080 Bluetooth headset (i.e., $39.99).

Social Validity

To assess the social validity, a social validity survey was distributed to each teaching parent who participated in the study. The survey contained 13 questions that asked the teaching parents to anonymously rate the acceptability of parent training procedures and their satisfaction with the outcomes of the parent training program on a 5-point scale with "0" being the worst rating and "4" being the best rating. The social validity survey was distributed to the teaching parents following each teaching parent's completion of the parent training program. (See Appendix X for social validity survey)

Results

Preference Assessment Training

Figure 1 displays results from the preference assessment parent training across all three teaching parents. The x-axis represents the number of sessions. The y-axis represents the percentage of preference assessment steps correctly completed by the parent.

During baseline, all three teaching parents were correctly implementing less than 60% of the parent behavior preference assessment steps when conducting preference assessments with their children. After receiving the detailed written instructions, all three teaching parents correctly implemented 100% of the parent behavior preference assessment steps for five consecutive preference assessments with their children.

Graduated Guidance Training

Figures 2-4 display results from the graduated guidance parent training across all three self-care skills (i.e., washing face, applying lotion, washing hands) for each parent-child dyad.

Jesse. Figure 2 displays both parent and child behavior during baseline and graduated guidance teaching sessions for Jesse and his mother. The x-axis represents the number of sessions and the y-axis represents the percentage of behavior steps correctly completed. The closed circles represent the percentage of self-care skill steps correctly and independently completed by the child. The open circles represent the percentage of graduated guidance teaching steps correctly completed by the parent. The open diamonds represent the percentage of post-training probe steps correctly completed by the parent. The letters (i.e., IF, DF) near the open circle data points represent the type of feedback that the primary investigator provided to the parent during the session. Specifically, IF indicates that the parent received immediate feedback from the primary investigator and DF indicates that the parent received delayed feedback from the primary investigator. The letters (i.e., FP, PP, SP) near the closed circle data points represent the most intrusive prompt that the parent delivered to the child during the session. Specifically, FP indicates that the parent provided a full physical prompt; PP indicates that the parent provided a partial physical prompt; and SP indicates that the parent provided a shadow prompt.

Washing face. During both general and graduated guidance baseline sessions, Jesse's mother correctly implemented less than 30% of graduated guidance teaching steps and Jesse correctly and independently completed less than 30% of the washing face skill steps. After Jesse's mother received the detailed written instructions on how to use graduated guidance to teach Jesse to wash his face, she began correctly implementing between 29% and 67% of graduated guidance teaching steps and Jesse correctly and independently completed less than 10% of the washing face skill steps. After Jesse's mother received the BST parent training package, she began correctly implementing over 90% of graduated guidance teaching steps and Jesse was quickly able to correctly and independently complete 100% of the washing face skill steps for three consecutive sessions.

Applying lotion. After graduated guidance teaching was completed for washing face, the next skill Jesse's mother was instructed to teach was applying lotion. During both general and graduated guidance baseline sessions, Jesse's mother correctly implemented less than 30% of graduated guidance teaching steps and Jesse correctly and independently completed less than 40% of the applying lotion skill steps. After Jesse's mother received the detailed written instructions on how to use graduated guidance to teach Jesse to apply lotion, Jesse's mother began correctly implementing over 95% of graduated guidance teaching steps and Jesse was quickly able to correctly and independently complete 100% of the applying lotion skill steps for three consecutive sessions.

Washing hands. After graduated guidance teaching was completed for applying lotion, the next skill Jesse's mother was instructed to teach was washing hands. During both general and graduated guidance baseline sessions, Jesse's mother correctly implemented less than 40% of graduated guidance teaching steps and Jesse correctly and independently completed less than

40% of the washing hands skill steps. After Jesse's mother received the detailed written instructions on how to use graduated guidance to teach Jesse to wash his hands, Jesse's mother began correctly implementing over 95% of graduated guidance teaching steps and Jesse was quickly able to correctly and independently complete over 90% of the washing hands skill steps for three consecutive sessions.

Post-training probes. During the post-training probe trial for washing face, Jesse's mother correctly implemented 100% of the post-training probe steps and Jesse correctly and independently completed 92% of the washing face skill steps. During the post-training probe trial for applying lotion, Jesse's mother correctly implemented 100% of the post-training probe steps and Jesse correctly and independently completed 100% of the applying lotion skill steps. During the post-training probe trial for washing hands, Jesse's mother correctly implemented 100% of the post-training probe steps and Jesse correctly and independently completed 100% of the washing hands skill steps.

Bobby. Figure 3 displays both parent and child behavior during baseline and graduated guidance teaching sessions for Bobby and his mother. The x-axis represents the number of sessions and the y-axis represents the percentage of behavior steps correctly completed. The closed circles represent the percentage of self-care skill steps correctly and independently completed by the child. The open circles represent the percentage of graduated guidance teaching steps correctly completed by the parent. The open diamonds represent the percentage of post-training probe steps correctly completed by the parent. The letters (i.e., IF, DF) near the open circle data points represent the type of feedback that the primary investigator provided to the parent during the session. Specifically, IF indicates that the parent received immediate feedback from the primary investigator and DF indicates that the parent received delayed

feedback from the primary investigator. The letters (i.e., FP, PP, SP) near the closed circle data points represent the most intrusive prompt that the parent delivered to the child during the session. Specifically, FP indicates that the parent provided a full physical prompt; PP indicates that the parent provided a partial physical prompt; and SP indicates that the parent provided a shadow prompt.

Washing face. During both general and graduated guidance baseline sessions, Bobby's mother correctly implemented less than 30% of graduated guidance teaching steps and Bobby correctly and independently completed less than 50% of the washing face skill steps. After Bobby's mother received the detailed written instructions on how to use graduated guidance to teach Bobby to wash his face, she began correctly implementing between 29% and 48% of graduated guidance teaching steps and Bobby correctly and independently completed less than 25% of the washing face skill steps. After Bobby's mother received the BST parent training package, she quickly began correctly implementing over 90% of graduated guidance teaching steps and Bobby was quickly able to correctly and independently complete 100% of the washing face skill steps for three consecutive sessions.

Applying lotion. After graduated guidance teaching was completed for washing face, the next skill Bobby's mother was instructed to teach was applying lotion. During both general and graduated guidance baseline sessions, Bobby's mother correctly implemented less than 30% of graduated guidance teaching steps and Bobby correctly and independently completed less than 40% of the applying lotion skill steps. After Bobby's mother received the detailed written instructions on how to use graduated guidance to teach Bobby to apply lotion, Bobby's mother began correctly implementing over 90% of graduated guidance teaching steps and Bobby was

quickly able to correctly and independently complete over 95% of the applying lotion skill steps for three consecutive sessions.

Washing hands. After graduated guidance teaching was completed for applying lotion, the next skill Bobby's mother was instructed to teach was washing hands. During both general and graduated guidance baseline sessions, Bobby's mother correctly implemented less than 40% of graduated guidance teaching steps and Bobby correctly and independently completed less than 65% of the washing hands skill steps. After Bobby's mother received the detailed written instructions on how to use graduated guidance to teach Bobby to wash his hands, Bobby's mother began correctly implementing over 95% of graduated guidance teaching steps and Bobby was quickly able to correctly and independently complete 100% of the washing hands skill steps for three consecutive sessions.

Post-training probes. During the post-training probe trial for washing face, Bobby's mother correctly implemented 100% of the post-training probe steps and Bobby correctly and independently completed 100% of the washing face skill steps. During the post-training probe trial for applying lotion, Bobby's mother correctly implemented 100% of the post-training probe steps and Bobby correctly and independently completed 100% of the applying lotion skill steps. During the post-training probe trial for washing hands, Bobby's mother correctly implemented 100% of the post-training probe steps and Bobby correctly and independently completed 100% of the washing hands skill steps.

Laura. Figure 4 displays both parent and child behavior during baseline, graduated guidance teaching sessions, and constant time delay probe trials for Laura and her mother. The x-axis represents the number of sessions and the y-axis represents the percentage of behavior steps correctly completed. The closed circles represent the percentage of self-care skill steps

correctly and independently completed by the child and are scaled to the left y-axis. The open circles represent the percentage of graduated guidance teaching steps correctly completed by the parent and are scaled to the left y-axis. The open triangles represent the percentage of constant time delay probe trial steps correctly completed by the parent and are scaled to the left y-axis. The open diamonds represent the percentage of post-training probe steps correctly completed by the parent and are scaled to the left y-axis. Finally, the red bars represent the percentage of self-care skill steps that contained problem behavior and are scaled to the right y-axis.

The letters (i.e., IF, DF) near the open circle data points and the open triangle data points represent the type of feedback that the primary investigator provided to the parent during the session. Specifically, IF indicates that the parent received immediate feedback from the primary investigator and DF indicates that the parent received delayed feedback from the primary investigator. The letters (i.e., FP, PP, SP) near the closed circle data points represent the most intrusive prompt that the parent delivered to the child during the session. Specifically, FP indicates that the parent provided a full physical prompt; PP indicates that the parent provided a partial physical prompt; and SP indicates that the parent provided a shadow prompt.

Washing face. During both general and graduated guidance baseline sessions, Laura's mother correctly implemented less than 30% of graduated guidance teaching steps and Laura correctly and independently completed less than 10% of the washing face skill steps. During baseline sessions, Laura was engaging in problem behavior for, on average, 13.8% of the washing face skill steps.

After Laura's mother received the detailed written instructions on how to use graduated guidance to teach Laura to wash her face, she began correctly implementing over 60% of graduated guidance teaching steps and Laura correctly and independently completed 0% of the

washing face skill steps. During graduated guidance written instruction sessions, Laura was engaging in problem behavior for, on average, 11.2% of the washing face skill steps.

After Laura's mother received the BST graduated guidance parent training package, she began correctly implementing over 90% of graduated guidance teaching steps and Laura continued to correctly and independently complete 0% of the washing face skill steps. After we instructed Laura's mother to start conducting constant time delay probe trials with Laura, Laura's mother was able to correctly implement 100% of constant time delay probe trial steps for three consecutive immediate feedback constant time delay trials and three consecutive delayed feedback constant time delay trials. Laura was able to correctly and independently complete over 75% of the washing face skill steps for three consecutive immediate feedback constant time delay trials and three consecutive delayed feedback constant time delay trials. During BST graduated guidance parent training package sessions, Laura was engaging in problem behavior for, on average, 1.6% of the washing face skill steps. During constant time delay probe trials, Laura was engaging in problem behavior for, on average, 1.4% of the washing face steps.

Applying lotion. After teaching was completed for washing face, the next skill Laura's mother was instructed to teach was applying lotion. During both general and graduated guidance baseline sessions, Laura's mother correctly implemented less than 40% of graduated guidance teaching steps and Laura correctly and independently completed less than 50% of the applying lotion skill steps. During baseline sessions, Laura was engaging in problem behavior for, on average, 12.6% of the applying lotion skill steps.

After Laura's mother received the detailed written instructions on how to use graduated guidance to teach Laura to apply lotion, Laura's mother began correctly implementing over 95% of graduated guidance teaching steps. During this phase, Laura's mother also correctly

implemented 100% of constant time delay probe trial steps for three consecutive immediate feedback constant time delay probe trials and three consecutive delayed feedback constant time delay probe trials. Laura was quickly able to correctly and independently complete over 85% of the applying lotion skill steps during three consecutive immediate feedback constant time delay probe trials and three consecutive delayed feedback constant time delay probe trials. During graduated guidance written instructions sessions, Laura was engaging in problem behavior for, on average, 1.1% of the applying lotion skill steps. Laura did not engage in any problem behavior during constant time delay probe trials.

Washing hands. After teaching was completed for applying lotion, the next skill Laura's mother was instructed to teach was washing hands. During both general and graduated guidance baseline sessions, Laura's mother correctly implemented less than 60% of graduated guidance teaching steps and Laura correctly and independently completed less than 50% of the washing hands skill steps. During baseline sessions, Laura was engaging in problem behavior for, on average, 19.7% of the washing hands skill steps.

After Laura's mother received the detailed written instructions on how to use graduated guidance to teach Laura to wash her hands, Laura's mother began correctly implementing 100% of graduated guidance teaching steps. During this phase, Laura's mother correctly implemented 100% of constant time delay probe trial steps for three consecutive immediate feedback constant time delay probe trials and three consecutive delayed feedback constant time delay probe trials. Laura was quickly able to correctly and independently complete over 88% of the washing hands skill steps during three consecutive immediate feedback constant time delay probe trials and three consecutive delayed feedback constant time delay probe trials. During graduated guidance written instructions sessions, Laura was engaging in problem behavior for, on average, 0.83% of

the washing hands skill steps. Laura did not engage in any problem behavior during constant time delay probe trials.

Post-training probes. During the post-training probe trial for washing face, Laura's mother correctly implemented 100% of the post-training probe steps and Laura correctly and independently completed 75% of the washing face skill steps. During the post-training probe trial for applying lotion, Laura's mother correctly implemented 100% of the post-training probe steps and Laura correctly and independently completed 88% of the applying lotion skill steps. During the post-training probe trial for washing hands, Laura's mother correctly implemented 100% of the post-training probe steps and Laura correctly and independently completed 88% of the washing hands skill steps. Laura did not engage in any problem behavior during post-training probe trials.

Telehealth Cost Analysis

Table 1 displays the results of the cost analysis of our telehealth parent training program across all three parent-child dyads. The telehealth cost analysis revealed that the total costs associated with purchasing the required telehealth technology (i.e., iPad mini, iPad case, Bluetooth ear bud) to deliver the parent training intervention through telehealth was $418.89 for each parent-child dyad. The range of costs associated with compensating a BCBA for mileage and travel time to deliver the parent training intervention in-vivo was $99.60 to $138.56 for Jesse, $595.67 to $832.94 for Laura, and $774.41 to $1112.93 for Bobby. Thus, our cost analysis indicated that the most cost-effective method by which to deliver the parent training intervention would be through telehealth technology for Laura and Bobby and through in-vivo for Jesse.

Social Validity

Table 2 displays the results of the social validity surveys that were distributed to the three teaching parents who participated in the study. The average rating reported by the teaching parents for how much they liked using the graduated guidance teaching procedures to teach their children was 3.67. The average rating reported by the teaching parents for how effective they thought the graduated guidance teaching procedures were in helping them teach their children was 4.0. The average rating reported by the teaching parents for how likely they were to continue using graduated guidance teaching procedures to teach their children other skills was 4.0. The average rating reported by the teaching parents for how likely they were to recommend the graduated guidance teaching procedures to other parents was 4.0. The average rating reported by the teaching parents for how much they liked the remote parent training program (i.e., using iPads and FaceTime rather than engaging in in-home, face-to-face interactions) was 3.67. The average rating reported by the teaching parents for how helpful they thought the remote training procedures were in teaching them to teach their children was 3.67. The average rating reported by the teaching parents for how helpful they thought the detailed written instructions were in teaching them to teach their children effectively was 4.0. The average rating reported by the teaching parents for how helpful they thought the graduated guidance overview/model/role play session was in teaching them to teach their children effectively was 3.67. The average rating reported by the teaching parents for how helpful they thought the BlueTooth coaching sessions were in teaching them to teach their children effectively was 3.67. The average rating reported by the teaching parents for how likely they were to recommend a remote parent training procedure to other parents was 4.0.

Finally, the average rating reported by the teaching parents for how satisfied they were with their children's ability to demonstrate self-care skills following training was 3.67 for

washing their face, 4.0 for applying lotion, and 4.0 for washing their hands. Furthermore, all teaching parents reported being more satisfied with their child's ability to complete each self-care skill after the parent training program concluded compared to before the parent training program began (based on the teaching parents' responses to the same question on the parent intake assessment survey) (see Table 3). Specifically, the average rating reported by the teaching parents for how satisfied they were with their children's ability to demonstrate self-care skills prior to training was 1.67 for washing their face, 2.0 for applying lotion, and 2.33 for washing their hands.

Discussion

The parent training program was successful in remotely teaching all parents to correctly implement both preference assessment and graduated guidance teaching procedures with near-perfect levels of fidelity. Furthermore, with correct implementation of graduated guidance teaching procedures, all parents were able to substantially increase their children's independent completion of three important self-care skills.

The type of parent training procedures required to teach parents appears to depend on what the parent is being taught to implement. Specifically, the present study revealed that providing parents with detailed written instructions was sufficient to teach them to correctly conduct preference assessments with their children. This result supports recent findings by Graff and Karsten (2012) that providing teachers with jargon-free, enhanced written instructions and data sheets significantly improved their implementation of stimulus preference assessments. The finding that parents can be successfully taught to conduct a preference assessment after receiving only detailed written instructions also adds to the preference assessment training literature by

replicating and extending the effects found by Graff and Karsten to parents of children with ASD.

While the results of the present study indicated that parents can be taught to conduct a preference assessment after receiving detailed written instructions, the present study demonstrated that providing parents with detailed written instructions alone was not sufficient to teach them to correctly implement graduated guidance teaching procedures with acceptable levels of fidelity. Although the instructions did increase parent implementation of graduated guidance compared to baseline levels, none of the parents were able to implement graduated guidance with 90% fidelity after receiving the instructions that described how to use graduated guidance to teach their children the first self-care skill. Rather, the delivery of the telehealth BST graduated guidance parent training package (i.e., graduated guidance overview, model, role-play with adult and receive immediate feedback, implement with child and receive immediate feedback, implement with child and receive delayed feedback) was required and successfully increased all three parents' implementation of graduated guidance to above 90% fidelity. After parents implemented graduated guidance with high levels of fidelity, all three children demonstrated substantial increases in their independent completion of self-care skills.

These results support previous research that has shown that telehealth parent training programs can successfully teach parents to implement new interventions with their children and that parent-implemented behavioral interventions can produce meaningful changes in child behavior (e.g., Baharav & Reiser, 2010; Wacker et al., 2013b; Vismara, Young, & Rogers, 2012; McDuffie et al., 2013). These findings also extend the telehealth parent training literature by demonstrating that BST procedures delivered via telehealth can be used to teach parents of children with ASD to correctly implement graduated guidance to teach their children self-care

skills. Furthermore, the current study was the first to use iPads and FaceTime videoconferencing technology to remotely deliver an entire BST parent training program. Future research should continue to assess how telehealth technology can be used to train parents because the practicality of delivering behavioral interventions via telehealth appears to be steadily increasing as more and more people are able to access videoconferencing technology (e.g., FaceTime, Skype, ooVoo) through their smart phones, tablets, and laptops.

Furthermore, our telehealth cost analysis showed that delivering the parent training intervention through telehealth was more cost-effective than delivering the parent training intervention through in-vivo methods for two (Laura and Bobby) of the three parent-child dyads. It appears that some of the factors that determine whether telehealth parent training programs are more cost-effective than in-vivo parent training programs are a) the distance the family lives from the parent-trainer (i.e., the greater the distance, the more cost-effective telehealth methods will be); b) the child's rate of learning (i.e., the longer it takes for a child to learn a skill or demonstrate desired levels of behavioral change and the more idiosyncratic procedural adaptations that are required to support the child's successful learning, the more cost-effective telehealth methods will be); and c) the number of parent training sessions required for the parent-trainer to teach parents to implement procedures with acceptable levels of fidelity (i.e., the more sessions required, the more cost-effective telehealth methods will be). For example, Bobby lived the greatest distance from the parent-trainer and the telehealth cost-savings were substantial. Additionally, Laura required more teaching sessions to learn the skill (i.e., washing her face), procedural adaptations were necessary, and more parent training sessions were needed; thus, the telehealth cost-savings were likewise substantial.

Parent implementation of the graduated guidance teaching procedures did not generalize to the remaining self-care skills after the parents had received the BST graduated guidance parent training package and had successfully used graduated guidance to teach their children the first self-care skill. This was true even though the parents received the same instruction from the primary investigator prior to each teaching session for each self-care skill (i.e., "Please use graduated guidance to teach your child to complete skill"). It is possible that this effect may have been a result of parents not attending to the primary investigator's instruction after repeated exposure to the same instruction throughout the study. It was not until parents received the detailed written instructions for each specific skill that their implementation of graduated guidance exceeded 90% fidelity. These detailed written instructions included reiterating the graduated guidance procedure along with a specific task analysis of the new self-care skill to be taught. Therefore, it is not known whether parents would be able to generalize the use of graduated guidance teaching procedures to teach novel skills if provided with multiple examples of how to break down a skill into behavioral steps (i.e., multiple examples of task analyses of self-care skills). An interesting extension of the current study might be to have parents practice writing task analyses of skills and then evaluate how accurately parents implement graduated guidance teaching procedures.

Laura's mother was also taught to correctly conduct constant time delay probe trials, embedded within graduated guidance teaching procedures, to better assess Laura's progress in learning self-care skills and to determine self-care skill mastery. As a result, this study extends the telehealth parent training literature by demonstrating that a parent can be remotely taught to correctly implement constant time delay probe trials through the delivery of oral instructions and feedback via telehealth technology. Additionally, the results of the current study suggest that the

addition of constant time delay probe trials embedded within a graduated guidance teaching procedure may help to better assess child progress when learning self-care skills, and, in turn, make graduated guidance teaching procedures more effective and efficient.

Furthermore, Laura not only provided the primary investigator with the opportunity to further refine the graduated guidance teaching procedure but also to examine the effect of this procedure on problem behavior. Laura was the one participant who engaged in problem behavior, which a recent functional analysis had determined was escape-maintained. Not surprisingly, the occurrence of her problem behavior decreased after exposure to the graduated guidance procedure, especially after implementation of the graduated guidance BST parent training package. This may have been due to the mother extinguishing Laura's problem behavior by not allowing Laura to escape the self-care skill. Future researchers may want to more fully explore the relationship between graduated guidance procedures and the reduction of problem behavior.

There are several potential limitations of the current study. First, due to an already established relationship between the parents and the primary investigator and between the parents and the EIBI program that is supervised by the primary investigator, these parents may have been more motivated to learn to implement both preference assessment and graduated guidance teaching procedures and to remain in the research program when faced with challenges or setbacks (e.g., difficulty teaching first skill, occurrence of problem behavior). Specifically, all three parents had been bringing their children to the center-based EIBI program that was supervised by the primary investigator for at least eight months prior to the beginning of the study. During that time, all three parents had also had at least three face-to-face interactions with the primary investigator each week, usually when the parents picked their children up from the

EIBI program at the end of the day. Anecdotally, all three parents repeatedly reported being very satisfied with improvements they had observed in their children's behavior (e.g., reductions in problem behavior, high acquisition rate of new skills) since their children had begun attending the EIBI program. Therefore, these parents may have been more motivated to implement, and to continue implementing, preference assessment and graduated guidance teaching procedures with high levels of accuracy throughout the study due to their prior relationship with the primary investigator and their observations that procedures used by the primary investigator in the EIBI program had produced desired changes in their children's behavior. Thus, it is unclear how successful this telehealth parent training program would be if the parent participants do not have a prior relationship with the parent-trainer. In therapeutic programs, relationship development should never be underestimated. Thus, future telehealth parent training programs may need to include additional pre-training components to ensure that a relationship between the parents and the parent-trainer is established before beginning the parent training program (e.g., rapport building during initial FaceTime sessions).

A second potential limitation of this study is that all three child participants had been exposed to graduated guidance teaching procedures prior to the beginning of the study as part of their EIBI program. Although graduated guidance had not been used within the children's EIBI program to teach the specific self-care skills that were taught in this study, these children may have learned to independently complete these self-care skills more quickly than other children who had not been exposed to graduated guidance teaching procedures. Future studies should be conducted to compare the effectiveness of graduated guidance in teaching new skills to children who have and have not had prior exposure to graduated guidance.

Third, the procedures in the present study did not include "skill mastery probe trials," such as the constant time delay probe trials used to assess skill mastery for Laura, for two of the three child participants (i.e., Jesse and Bobby). Therefore, because the graduated guidance teaching procedures did not give the children the opportunity to independently complete each self-care skill until the parent had completely faded out her physical prompts (per the prompt-fading procedure), Jesse or Bobby may have been able to independently complete the self-care skills before their parents completely removed their physical prompts (e.g., after one or two graduated guidance teaching sessions). Future researchers may want to include skill mastery probe trials (e.g., constant time delay probe trials) prior to each graduated guidance teaching session to better assess skill mastery and avoid unnecessary teaching sessions (i.e., make graduated guidance teaching maximally efficient).

Fourth, our graduated guidance BST parent training package involved a number of components including oral instructions and an oral knowledge quiz, modeling, role-play exercises, immediate feedback (coaching) procedures, and delayed feedback procedures. Since a component analysis was not conducted, it is unclear whether the use of all of these components was necessary to increase parent implementation of graduated guidance teaching procedures to above 90% fidelity. For example, after parents were unable to implement graduated guidance with at least 90% fidelity after receiving the detailed written instructions, simply providing parents with immediate feedback (coaching) while they were implementing graduated guidance with their children may have been sufficient to increase parent implementation of graduated guidance to acceptable levels of fidelity. Future researchers may want to conduct component analyses of BST (that include detailed written instructions rather than "traditional" written instructions) to further evaluate the necessity and sufficiency of the BST components. Future

studies could also evaluate the effectiveness of different combinations of detailed written instructions in addition to other BST components (e.g., detailed written instructions alone, detailed written instructions plus immediate feedback/coaching, detailed written instructions plus modeling and immediate feedback/coaching) in teaching parents to implement new interventions with their children.

A final limitation of the present study is that parent-implemented graduated guidance was not completely successful in teaching one child participant, Laura, to consistently complete self-care skills with above 90% independence. Unlike Jesse and Bobby, Laura's ABLLS assessment indicated that Laura was only able to demonstrate 4% of all assessed skills and, more specifically, 0% of grooming skills and 21% of fine motor skills, prior to the beginning of the current study. Thus, it is not surprising that Laura required more teaching sessions to demonstrate improvement in skill acquisition. To better assess some children's progress in learning multi-step, self-care skills, a supplementary assessment procedure, such as constant time delay probe trials, may need to be used in conjunction with graduated guidance teaching procedures. Although it is unknown whether Laura would have eventually been able to independently complete these self-care skills if Laura's mother had continued to implement graduated guidance teaching procedures to teach these skills, it appears that graduated guidance without probe trials may not have been the most efficient teaching procedure for teaching Laura multi-step, self-care skills. Future researchers may want to compare the effectiveness of remotely training parents to implement different types of commonly used teaching procedures (e.g., graduated guidance, forward chaining, backward chaining, time delay procedures) in teaching multi-step, self-care skills to a wide variety of children with ASD (e.g., children of different functioning levels, children that display escape-maintained problem behavior).

In summary, the present study illustrates that parents can be taught to correctly implement a preference assessment and graduated guidance teaching procedure through a parent training program that did not include in-person interactions. Specifically, this study indicates that providing parents with detailed written instructions appears to be sufficient to teach parents to conduct preference assessments with their children yet not sufficient to teach parents to correctly implement graduated guidance teaching procedures to teach a self-care skill. Rather, it appears that some combination of modeling, role-play, and feedback procedures is necessary to teach parents to implement a prompt-fading teaching procedure such as graduated guidance. The current study, however, demonstrated that these additional BST parent training procedures can be successfully delivered to parents through the use of telehealth technology. After learning how to use graduated guidance to teach the first self-care skill through telehealth BST procedures, all parents were able to generalize graduated guidance teaching procedures to teach their children other self-care skills after receiving detailed written instructions that included a task analysis of each self-care skill. Furthermore, two parents were able to use graduated guidance teaching procedures to teach their children to independently complete over 90% of self-care skills steps for three self-care skills and one parent was able to use graduated guidance and constant time delay probe trials to teach her child to independently complete over 75% of self-care skill steps for one self-care skill (i.e., washing face) and over 88% of self-care skill steps for two self-care skills (i.e., applying lotion and washing hands).

Based on the results of the current study, future researchers may want to evaluate the effectiveness of similar telehealth parent training procedures in teaching parents to implement other prompting procedures (e.g., three-step prompting, most-to-least prompting) that are commonly used to teach children with ASD. Researchers might also assess the effectiveness of

remote parent training in teaching parents to implement procedures to address other important issues that may arise in the family home (e.g., potty training, sleeping issues, eating issues). Finally, future studies should be conducted to further evaluate the effectiveness of detailed jargon-free written instructions in teaching parents, teachers, or staff to implement a variety of new skills (e.g., functional analyses, behavior management protocols) with those whom they work.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.

Antonini, T. N., Raj, S. P., Oberjohn, K. S., & Wade, S. L. (2012). An online positive parenting skills programme for paediatric traumatic brain injury: Feasibility and parental satisfaction. *Journal of Telemedicine and Telecare*, *18*(6), 333-338.

Association of Professional Behavior Analysts. (2009). *Professional Employment Survey Results.* Retrieved from www.apbahome.net/survey-report-johnston.pdf

Baer, D. M., & Wolf, M. M. (1986). Some still-current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis*, *20*(4), 313-327.

Baharav, E., & Reiser, C. (2010). Using telepractice in parent training in early autism. *Telemedicine and e-Health*, *16*(6), 727-731.

Barretto, A., Wacker, D. P., Harding, J., Lee, J., & Berg, W. K. (2006). Using telemedicine to conduct behavioral assessments. *Journal of Applied Behavior Analysis*, *39*(3), 333-340.

Baum, C. G., & Forehand, R. (1981). Long term follow-up assessment of parent training by use of multiple outcome measures. *Behavior Therapy*, *12*(5), 643-652.

Bauman, K. E., Reiss, M. L., Rogers, R. W., & Bailey, J. S. (1983). Dining out with children: Effectiveness of parent advice package on pre-meal inappropriate behavior. *Journal of Applied Behavior Analysis*, *16*(1), 55-68.

Ben-Chaabane, D. B. B., Alber‐Morgan, S. R., & DeBar, R. M. (2009). The effects of parent-implemented PECS training on improvisation of mands by children with autism. *Journal of Applied Behavior Analysis*, *42*(3), 671-677.

Berg, B. W., Wong, L., & Vincent, D. S. (2007). Teaching nursing skills at a distance using a remotely controlled human patient simulator. *Journal of Telemedicine and Telecare*, *13*(suppl 3), 17-19.

Boisvert, M., Lang, R., Andrianopoulos, M., & Boscardin, M. L. (2010). Telepractice in the assessment and treatment of individuals with autism spectrum disorders: A systematic review. *Developmental Neurorehabilitation, 13*(6), 423-432.

Cordisco, L. K., Strain, P. S., & Depew, N. (1988). Assessment for generalization of parenting skills in home settings. *Journal of the Association for Persons with Severe Handicaps, 13*(3), 202-210.

Centers for Disease Control and Prevention (2014). Prevalence of autism spectrum disorder among children aged 8 years- Autism and developmental disabilities monitoring network, 11 sites, United States, 2010. *Morbidity and Mortality Weekly Report Surveillance Summary, 63*(2), 1-21.

Charlop-Christy, M. H., & Carpenter, M. H. (2000). Modified incidental teaching sessions a procedure for parents to increase spontaneous speech in their children with autism. *Journal of Positive Behavior Interventions*, *2*(2), 98-112.

Connell, S., Sanders, M. R., & Markie-Dadds, C. (1997). Self-directed behavioral family intervention for parents of oppositional children in rural and remote areas. *Behavior Modification*, *21*(4), 379-408.

Cowain, T. (2001). Cognitive-behavioural therapy via videoconferencing to a rural area. *Australasian Psychiatry*, *35*(1), 62-64.

Crockett, J. L., Fleming, R. K., Doepke, K. J., & Stevens, J. S. (2007). Parent training: Acquisition and generalization of discrete trials teaching skills with parents of children with autism. *Research in Developmental Disabilities*, *28*(1), 23-36.

Dachman, R. S., Halasz, M. M., Bickett, A. D., & Lutzker, J. R. (1984). A home-based ecobehavioral parent-training and generalization package with a neglectful mother. *Education & Treatment of Children*, *7*(3), 183-202.

Dansky, K. H., Palmer, L., Shea, D., & Bowles, K. H. (2001). Cost analysis of telehomecare. *Telemedicine Journal and e-Health*, *7*(3), 225-232.

DeLeon, I. G. & Iwata, B. A. (1996). Evaluation of a multiple-stimulus presentation format for assessing reinforcer preferences. *Journal of Applied Behavior Analysis*, *29*, 519–533.

Ducharme, J. M., & Feldman, M. A. (1992). Comparison of staff training strategies to promote generalized teaching skills. *Journal of Applied Behavior Analysis, 25*, 165-179. doi: 10.1901/jaba.1992.25-165.

Dudding, C. C. (2009). Digital videoconferencing applications across the disciplines. *Communication Disorders Quarterly*, *30*(3), 178-182.

Duffy, T. M., & Kirkley, J. R. (2004). *Learner-centered theory and practice in distance education: Cases from higher education*. Mahwah, NJ: Lawrence Erlbaum Associates Publishers.

Elford, R., White, H., Bowering, R., Ghandi, A., Maddiggan, B., & St John, K. (2000). A randomized, controlled trial of child psychiatric assessments conducted using videoconferencing. *Journal of Telemedicine and Telecare*, *6*(2), 73-82.

Feldman, M. A., Case, L., Rincover, A., Towns, F., & Betel, J. (1989). Parent Education Project III: Increasing affection and responsivity in developmentally handicapped mothers:

Component analysis, generalization, and effects on child language. *Journal of Applied Behavior Analysis*, *22*(2), 211-222.

Feldman, M. A., Towns, F., Betel, J., Case, L., Rincover, A., & Rubino, C. A. (1986). Parent education project: II. Increasing stimulating interactions of develop mentally handicapped mothers. *Journal of Applied Behavior Analysis*, *19*(1), 23-37.

Flynn, L., & Healy, O. (2012). A review of treatments for deficits in social skills and self-help skills in autism spectrum disorder. *Research in Autism Spectrum Disorders*, *6*, 431–441.

Forehand, R., Cheney, T., & Yoder, P. (1974). Parent behavior training: Effects on the non-compliance of a deaf child. *Journal of Behavior Therapy and Experimental Psychiatry*, *5*(3), 281-283.

Friedman, R. H., Kazis, L. E., Jette, A., Smith, M. B., Stollerman, J., Torgerson, J., & Carey, K. (1996). A telecommunications system for monitoring and counseling patients with hypertension: Impact on medication adherence and blood pressure control. *American Journal of Hypertension*, *9*(4), 285-292.

Gardner, J. M. (1972). Teaching behavior modification to nonprofessionals. *Journal of Applied Behavior Analysis, 5* (4), 517-521. doi: 10.1901/jaba.1972.5-517

Gibson, J. L., Pennington, R. C., Stenhoff, D. M., & Hopper, J. S. (2010). Using desktop videoconferencing to deliver interventions to a preschool student with autism. *Topics in Early Childhood Special Education*, *29*(4), 214-225.

Giebenhain, J. E., & O'Dell, S. L. (1984). Evaluation of parent training manual for reducing children's fear of the dark. *Journal of Applied Behavior Analysis*, *17*(1), 121-125.

Givens, G. D., Blanarovich, A., Murphy, T., Simmons, S., Blach, D., & Elangovan, S. (2003). Internet-based tele-audiometry system for the assessment of hearing: A pilot

study. *Telemedicine Journal and e-Health*, *9*(4), 375-378.

Glueckauf, R. L., Fritz, S. P., Ecklund-Johnson, E. P., Liss, H. J., Dages, P., & Carney, P. (2002). Videoconferencing-based family counseling for rural teenagers with epilepsy: Phase 1 findings. *Rehabilitation Psychology*, *47*(1), 49-72.

Graff, R. B., & Karsten, A. M. (2012). Evaluation of a self-instruction package for conducting stimulus preference assessments. *Journal of Applied Behavior Analysis, 45*, 69-82. doi: 10.1901/jaba.2012.45-69.

Haozous, E., Doorenbos, A. Z., Demiris, G., Eaton, L. H., Towle, C., Kundu, A., & Buchwald, D. (2012). Role of telehealth/videoconferencing in managing cancer pain in rural American Indian communities. *Psycho‐Oncology*, *21*(2), 219-223.

Hudson, A. M. (1982). Training parents of developmentally handicapped children: A component analysis. *Behavior Therapy, 13*, 325–333.

Hughes, R. C., & Wilson, P. H. (1989). Behavioral parent training: Contingency management versus communication skills training with or without the participation of the child. *Child & Family Behavior Therapy*, *10*(4), 11-23.

Ingersoll, B., & Gergans, S. (2007). The effect of a parent-implemented imitation intervention on spontaneous imitation skills in young children with autism. *Research in Developmental Disabilities*, *28*(2), 163-175.

Jasmin, E., Couture, M., Fombonne, E., & Gisel, E. (2009). Sensori-motor and daily living skills of preschool children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *39*(2), 231–241doi:10.1007/s10803-008-0617-z.

Kaiser, A. P., Hancock, T. B., & Nietfeld, J. P. (2000). The effects of parent-implemented enhanced milieu teaching on the social communication of children who have autism. *Early Education and Development*, *11*(4), 423-446.

Kashinath, S., Woods, J., & Goldstein, H. (2006). Enhancing generalized teaching strategy use in daily routines by parents of children with autism. *Journal of Speech, Language, and Hearing Research*, *49*(3), 466-485.

Kelso, G. L., Fiechtl, B. J., Olsen, S. T., & Rule, S. (2009). The feasibility of virtual home visits to provide early intervention: A pilot study. *Infants & Young Children*, *22*(4), 332-340.

Kiesel, K. B., Lutzker, J. R., & Campbell, R. V. (1989). Behavioral relaxation training to reduce hyperventilation and seizures in a profoundly retarded epileptic child. *Journal of the Multihandicapped Person*, *2*(3), 179-190.

Koegel, R. L., Bimbela, A, & Schreibman, L. (1996). Collateral effects of parent training on family interactions. *Journal of Autism and Developmental Disorders, 26*(3), 347-359.

Koegel, R. L., Glahn, T. J., & Nieminen, G. S. (1978). Generalization of parent-training results. *Journal of Applied Behavior Analysis*, *11*(1), 95-109.

Koegel, R. L., Schreibman, L., Britten, K. R., Burke, J. C., & O'Neill, R. E. (1982). A comparison of parent training to direct child treatment. In R. L. Koegel, A. Rincover, & A. L. Egel (Eds.), *Educating and Understanding Autistic Children*, (pp. 260-279). San Diego, CA: College-Hill Press.

Koegel, R. L., Symon, J. B., & Koegel, L. K. (2002). Parent education for families of children with autism living in geographically distant areas. *Journal of Positive Behavior Interventions*, *4*(2), 88-103.

Kogan, M. D., Strickland, B. B., Blumberg, S. J., Signh, G. K., Perrin, J. M., & Van Dyck, P. C. (2008). A national profile of health care experiences and family impact of autism spectrum disorder among children in the United States, 2005-2006. *Pediatrics, 122*(6), 1149-1158.

Kroeger, K., & Sorensen, R. (2010). A parent training model for toilet training children with autism. *Journal of Intellectual Disability Research*, *54*(6), 556-567.

Krumhus, K. M., & Malott, R. W. (1980). The effects of modeling and immediate and delayed feedback in staff training. *Journal of Organizational Behavior Management, 2*, 279–293.

Krumm, M., Ribera, J., & Klich, R. (2007). Providing basic hearing tests using remote computing technology. *Journal of Telemedicine and Telecare*, *13*(8), 406-410.

Kuhn, S. A., Lerman, D. C., & Vorndran, C. M. (2003). Pyramidal training for families of children with problem behavior. *Journal of Applied Behavior Analysis*, *36*(1), 77-88.

Lafasakis, M., & Sturmey, P. (2007). Training parent implementation of discrete−trial teaching: Effects on generalization of parent teaching and child correct responding. *Journal of Applied Behavior Analysis*, *40*(4), 685-689.

Laski, K. E., Charlop, M. H., & Schreibman, L. (1988). Training parents to use the natural language paradigm to increase their autistic children's speech. *Journal of Applied Behavior Analysis*, *21*(4), 391-400.

Machalicek, W., O'Reilly, M., Chan, J. M., Lang, R., Rispoli, M., Davis, T., Shogren, K., Sigafoos, J., Lanioni, G., Antonucci, M., Langthorne, P., Andrews, A., & Didden, R. (2009). Using videoconferencing to conduct functional analysis of challenging behavior and develop classroom behavioral support plans for students with autism. *Education and Training in Developmental Disabilities*, *44*(2), 207-217.s

Machalicek, W., O'Reilly, M., Chan, J. M, Rispoli, M., Lang, R., Davis, T., Shogren, K., Sorrells, A., Lancioni, G., Sigafoos, J., Green, V., & Langthorne, P. (2013). Using videoconferencing to support teachers to conduct preference assessments with students with autism and developmental disabilities. *Research in Autism Spectrum Disorders, 3*(1), 32-41.

Mason, J. M., Young, R. J., New, J. P., Gibson, J. M., Long, A. F., Gambling, T., & Friede, T. (2006). Economic analysis of a telemedicine intervention to improve glycemic control in patients with diabetes mellitus. *Disease Management & Health Outcomes*, *14*(6), 377-385.

Matson, J. L., & Smith, K. R. M. (2008). Current status of intensive for young children with autism and PDD-NOS. *Research in Autism Spectrum Disorders, 2*(1), 60-74.

McCullough, A. (2001). Viability and effectiveness of teletherapy for pre-school children with special needs. *International Journal of Language & Communication Disorders*, *36*(suppl 1), 321-326.

McDuffie, A., Machalicek, W., Oakes, A., Haebig, E., Weismer, S. E., & Abbeduto, L. (2013). Distance video-teleconferencing in early intervention: Pilot study of a naturalistic parent-implemented language intervention. *Topics in Early Childhood Special Education*. Advance online publication. doi: 10.1177/0271121413476348.

Miltenberger, R. G. (2004). Behavioral skills training procedures. In R. G. Miltenberger (Ed.), *Behavior modification principles and procedures* (pp. 237-249). Belmont, CA: Thompson Wadsworth.

Myers, C. (2005). Telehealth applications in head and neck oncology. *Journal of Speech Language Pathology and Audiology*, *29*(3), 125.

National Research Council. (2001). *Educating Children with Autism.* Washington, DC: National Academy Press.

Nelson, E. L., Barnard, M., & Cain, S. (2003). Treating childhood depression over videoconferencing. *Telemedicine Journal and e-Health*, *9*(1), 49-55.

O'Brian, S., Packman, A., & Onslow, M. (2008). Telehealth delivery of the Camperdown Program for adults who stutter: A Phase I trial. *Journal of Speech, Language and Hearing Research*, *51*(1), 184.

O'Reilly, R., Bishop, J., Maddox, K., Hutchinson, L., Fisman, M., Takhar, J. (2007). Is telepsychiatry equivalent to face-to-face psychiatry? Results from a randomized controlled equivalence trial. *Psychiatric Services, 58*(6), 836-843.

Olsen, S., Fiechtl, B., & Rule, S. (2012). An evaluation of virtual home visits in early intervention: Feasibility of "virtual intervention". *Volta Review*, *112*(3), 267-281.

Palsbo, S. E. (2007). Equivalence of functional communication assessment in speech pathology using videoconferencing. *Journal of Telemedicine and Telecare*, *13*(1), 40-43.

Piette, J. D., Gregor, M. A., Share, D., Heisler, M., Bernstein, S. J., Koelling, T., & Chan, P. (2008). Improving heart failure self‐management support by actively engaging out of home caregivers: Results of a feasibility study. *Congestive Heart Failure*, *14*(1), 12-18.

Peterson, A. V., Kealey, K. A., Mann, S. L., Marek, P. M., Ludman, E. J., Liu, J., & Bricker, J. B. (2009). Group-randomized trial of a proactive, personalized telephone counseling intervention for adolescent smoking cessation. *Journal of the National Cancer Institute*, *101*(20), 1378-1392.

Radhakrishnan, K., Jacelon, C., & Roche, J. (2012). Perceptions on the use of telehealth by homecare nurses and patients with heart failure: A mixed method study. *Home Health Care Management & Practice*, *24*(4), 175-181.

Reese, R. J., Slone, N. C., Soares, N., & Sprang, R. (2012). Telehealth for underserved families: An evidence-based parenting program. *Psychological Services*, *9*(3), 320-322.

Robertson, R. E., Wehby, J. H., & King, S. M. (2013). Increased parent reinforcement of spontaneous requests in children with autism spectrum disorder: Effects on problem behavior. *Research in Developmental Disabilities*, *34*(3), 1069-1082.

Rocha, M. L., Schreibman, L., & Stahmer, A. C. (2007). Effectiveness of training parents to teach joint attention in children with autism. *Journal of Early Intervention*, *29*(2), 154-172.

Rule, S., Salzberg, C. L., Higbee, T. S., Menlove, R., & Smith, J. (2006). Technology-mediated consultation to assist rural students: A case study. *Rural Special Education Quarterly*, *25*(2), 3-7.

Sallis, J. F. (1983). Aggressive behaviors of children: A review of behavioral interventions and future directions. *Education & Treatment of Children*, *6*(2), 175-191.

Shaikh, U., Cole, S. L., Marcin, J. P., & Nesbitt, T. S. (2008). Clinical management and patient outcomes among children and adolescents receiving telemedicine consultations for obesity. *Telemedicine and e-Health*, *14*(5), 434-440.

Singh, P., & Pan, W. (2004). Online education: Lessons for administrators and instructors. *College Student Journal*, *38*(2), 302-308.

Stahmer, A. C., & Gist, K. (2001). The effects of an accelerated parent education program on technique mastery and child outcome. *Journal of Positive Behavior Interventions*, *3*(2), 75-82.

Stokes, J. V., & Luiselli, J. K. (2008). In-home parent training of functional analysis skills. *International Journal of Behavioral Consultation and Therapy*, *4*(3), 259-263.

Suess, A. N., Romani, P. W., Wacker, D. P., Dyson, S. M., Kuhle, J. L., Lee, J. F., ... & Waldron, D. B. (2013). Evaluating the treatment fidelity of parents who conduct in-home functional communication training with coaching via telehealth. *Journal of Behavioral Education*, *23*(1), 1-26.

Swanepoel, D. W., Koekemoer, D., & Clark, J. (2010). Intercontinental hearing assessment-a study in tele-audiology. *Journal of Telemedicine and Telecare*, *16*(5), 248-252.

Symon, J. B. (2001). Parent education for autism issues in providing services at a distance. *Journal of Positive Behavior Interventions*, *3*(3), 160-174.

Tarbox, J., Wallace, M. D., & Tarbox, R. S. (2002). Successful generalized parent training and failed schedule thinning of response blocking for automatically maintained object mouthing. *Behavioral Interventions*, *17*(3), 169-178.

The Council of State Governments (2013). *State Employee Mileage Reimbursement Rates.* Retrieved from http://knowledgecenter.csg.org/kc/system/files/mileage_2.pdf

Vismara, L. A., McCormick, C., Young, G. S., Nadhan, A., & Monlux, K. (2013). Preliminary findings of a telehealth approach to parent training in autism. *Journal of Autism and Developmental Disorders*. doi: 10.1007/s10803-013-1841-8.

Vismara, L. A., Young, G. S., & Rogers, S. J. (2012). Telehealth for expanding the reach of early autism training to parents. *Autism Research and Treatment*. doi:10.1155/2012/121878.

Vismara, L. A., Young, G. S., Stahmer, A. C., Griffith, E. M., & Rogers, S. J. (2009). Dissemination of evidence-based practice: Can we train therapists from a distance? *Journal of Autism and Developmental Disorders*, *39*(12), 1636-1651.

Vollmer, T. R., Marcus, B. A., & LeBlanc, L. (1994). Treatment of self‐injury and hand mouthing following inconclusive functional analyses. *Journal of Applied Behavior Analysis*, *27*(2), 331-344.

Wacker, D. P., Lee, J. F., Dalmau, Y. C. P., Kopelman, T. G., Lindgren, S. D., Kuhle, J., Pelzel, K. E., Dyson, S., Schieltz, K. M., & Waldron, D. B. (2013). Conducting functional communication training via telehealth to reduce the problem behavior of young children with autism. *Journal of Developmental and Physical Disabilities*, *25*(1), 35-48.

Wacker, D. P., Lee, J. F., Dalmau, Y. C. P., Kopelman, T. G., Lindgren, S. D., Kuhle, J., Pelzel, K. E., & Waldron, D. B. (2013). Conducting functional analyses of problem behavior via telehealth. *Journal of Applied Behavior Analysis*, *46*(1), 31-46.

Wade, S. L., Oberjohn, K., Burkhardt, A., & Greenberg, I. (2009). Feasibility and preliminary efficacy of a web-based parenting skills program for young children with traumatic brain injury. *The Journal of Head Trauma Rehabilitation*, *24*(4), 239-247.

Wade, S. L., Walz, N. C., Carey, J., McMullen, K. M., Cass, J., Mark, E., & Yeates, K. O. (2012). A randomized trial of teen online problem solving: Efficacy in improving caregiver outcomes after brain injury. *Health Psychology*, *31*(6), 767.

Ward-Horner, J., & Sturmey, P. (2012). Component analysis of behavior skills training in functional analysis. *Behavioral Interventions, 27* (2), 75-92. doi: 10.1002/bin.1339

Wasem, C. & Puskin, D. (2000). High-tech with the human touch: Using telehealth to reach America's children. *Professional Psychology: Research and Practice*, *31*(1), 3-4.

Werle, M.A., Murphy, T.B., Budd, K.S. (1993). Treating chronic food refusal in young children: Home-based parent training. *Journal of Applied Behavior Analysis, 26*(4), 421-433.

Williams, B. F., Williams, R. L., & McLaughlin, T. F. (1991). Classroom procedures for remediating behavior disorders. *Journal of Developmental and Physical Disabilities*, *3*(4), 349-384.

Table 1.

Results of the Cost Analysis of the Telehealth Parent Training Program Across All Three Parent-Child Dyads

Parent-Child Dyad	Total Telehealth Sessions	Round-Trip Mileage	Range of Mileage Reimbursement Costs[a]	Round-Trip Travel Time	Range of Travel Time Reimbursement Costs[b]	Range of In-Vivo Costs[c]	Telehealth Costs[d]	Most Cost Effective Training Method
Jesse	10	6.2 miles	$21.70-$34.72	16 min	$77.90-$103.84	$99.60 to $138.56	$418.89	In-Vivo
Laura	52	8 miles	$145.60-$232.96	18 min	$450.07-$599.98	$595.67-$832.94	$418.89	Telehealth
Bobby	14	61.6 miles	$301.84-$482.95	70 min	$472.57-$629.98	$774.41 to $1112.93	$418.89	Telehealth

Note. It was assumed that the length of sessions would be equivalent across telehealth sessions and in-vivo sessions and that the cost of the parent-trainer would be equal for both types of sessions. Baseline and written instruction sessions were excluded from this analysis. [a]The mileage reimbursement rate range was $0.35/mile to $0.56/mile. [b]The BCBA hourly rate range was $28.85/hr to $38.46/hr. [c]These costs were calculated by multiplying the round-trip mileage by the mileage reimbursement range and adding that figure to the round-trip travel time multiplied by the BCBA hourly rate range. Finally, that number was multiplied by the total number of telehealth parent training sessions [d]These costs were calculated by adding the costs of the iPad mini, iPad mini case, and Bluetooth ear bud.

Table 2.

Social Validity Scores from Teaching Parents

1) How much did you like using the graduated guidance teaching procedures to teach your child?

Greatly disliked	0	1	2	3	4	Liked a great deal
Number of Responses				1	2	

2) How effective do you think the graduated guidance teaching procedures were in helping you teach your child?

Very ineffective	0	1	2	3	4	Very effective
Number of Responses					3	

3) How likely are you to continue using the graduated guidance teaching procedures to teach your child other skills?

Very unlikely	0	1	2	3	4	Very likely
Number of Responses					3	

4) How likely are you to recommend the graduated guidance teaching procedures to other parents?

Very unlikely	0	1	2	3	4	Very likely
Number of Responses					3	

5) How much did you like the remote parent training program (i.e., using iPads and FaceTime rather than engaging in in-home, face-to-face interactions)?

Greatly disliked	0	1	2	3	4	Liked a great deal
Number of Responses				1	2	

6) Overall, how helpful do you think the remote parent training procedures were in teaching you to teach your child effectively?

Very unhelpful	0	1	2	3	4	Very helpful
Number of Responses				1	2	

7) How helpful do you think the detailed written instructions were in teaching you to teach your child effectively?

Very unhelpful	0	1	2	3	4	Very helpful
Number of Responses					3	

8) How helpful do you think the graduated guidance overview/model/role play session was in teaching you to teach your child effectively?

Very unhelpful	0	1	2	3	4	Very helpful
Number of Responses				1	2	

9) How helpful do you think the BlueTooth coaching sessions were in teaching you to teach your child effectively?

Very unhelpful	0	1	2	3	4	Very helpful
Number of Responses				1	2	

10) How likely are you to recommend a remote parent training program to other parents?

Very unlikely	0	1	2	3	4	Very likely
Number of Responses					3	

11) Please rate on a scale of "0-4" how *satisfied* (with "0" being "not at all satisfied" and "4" being "very satisfied") you are with your child's ability to demonstrate each of the following skills:

- **Washing Face**

Not at all satisfied	0	1	2	3	4	Very satisfied
Number of Responses				1	2	

- **Washing Hands**

Not at all satisfied	0	1	2	3	4	Very satisfied
Number of Responses					3	

- **Applying Lotion**

Not at all satisfied	0	1	2	3	4	Very satisfied
Number of Responses					3	

Table 3.

Intake Assessment Survey Responses from Teaching Parents

Please rate on a scale of "0-4" how *satisfied* (with "0" being "not at all satisfied" and "4" being "very satisfied") you are with your child's ability to demonstrate each of the following skills:

- **Washing Face**

Not at all satisfied	0	1	2	3	4	Very satisfied
Number of Responses		1	2			

- **Washing Hands**

Not at all satisfied	0	1	2	3	4	Very satisfied
Number of Responses			2	1		

- **Applying Lotion**

Not at all satisfied	0	1	2	3	4	Very satisfied
Number of Responses			3			

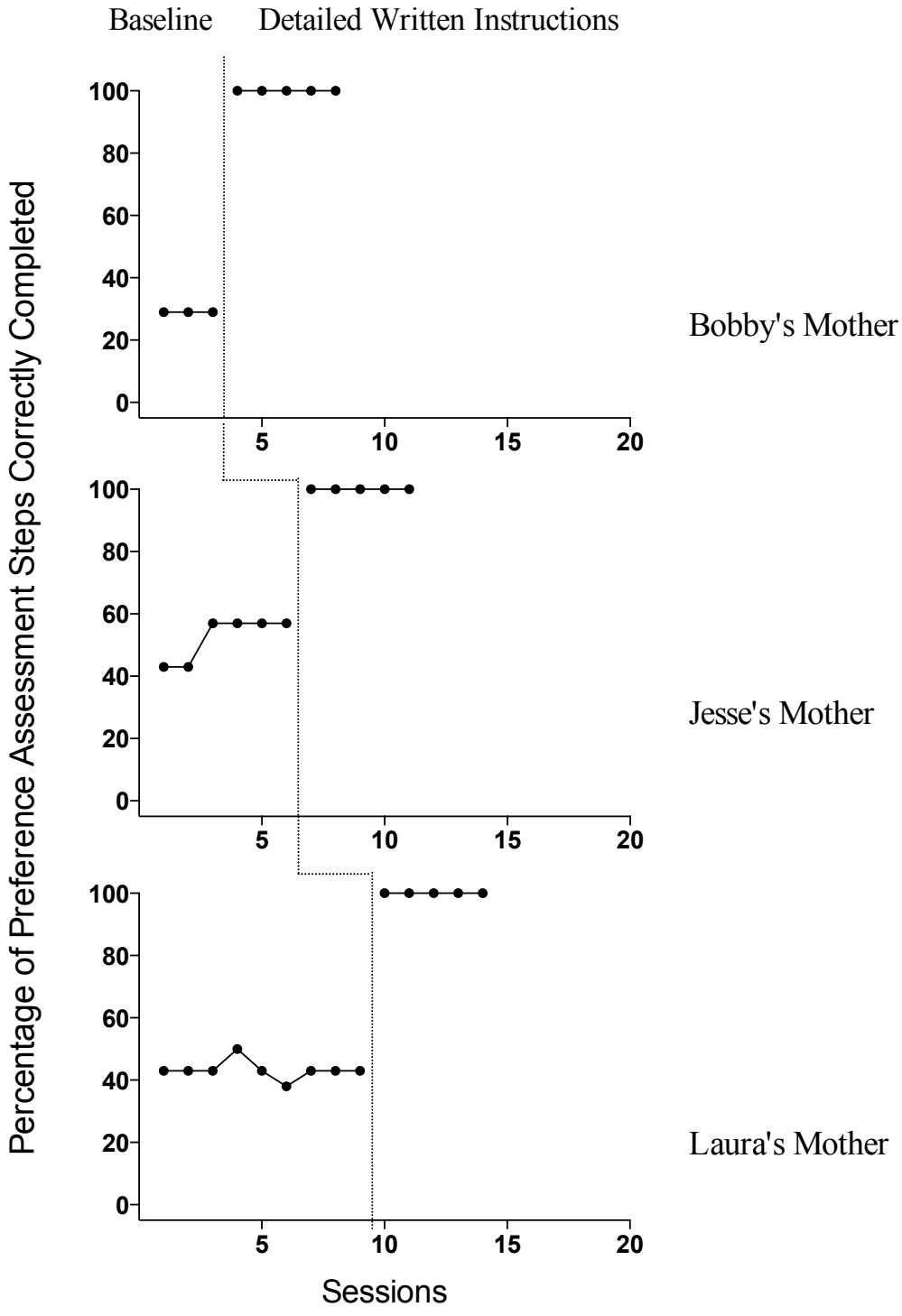

Figure 1. Results from preference assessment training across teaching parents

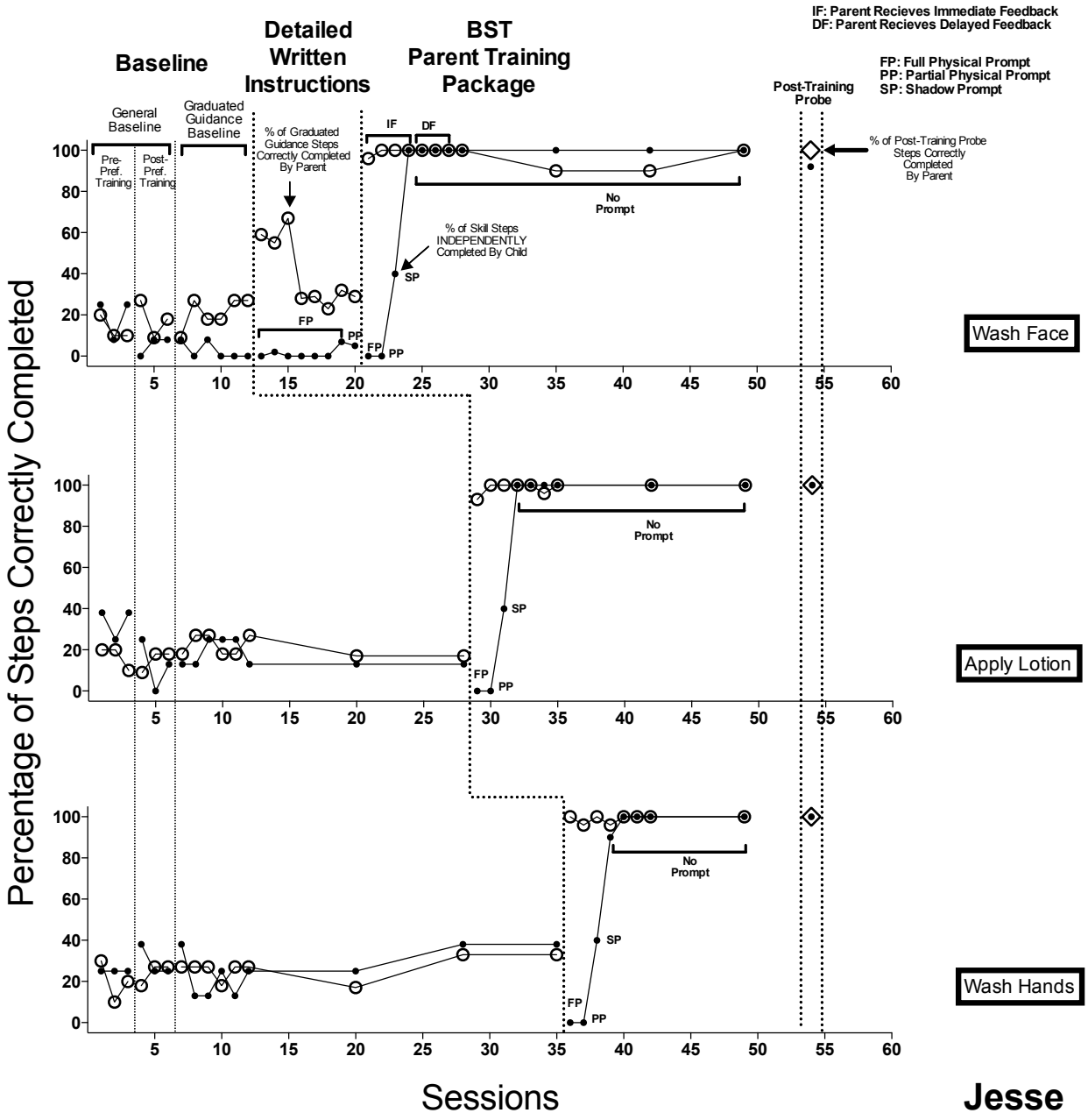

Figure 2. Results from graduated guidance training for Jesse and Jesse's mother across self-care skills

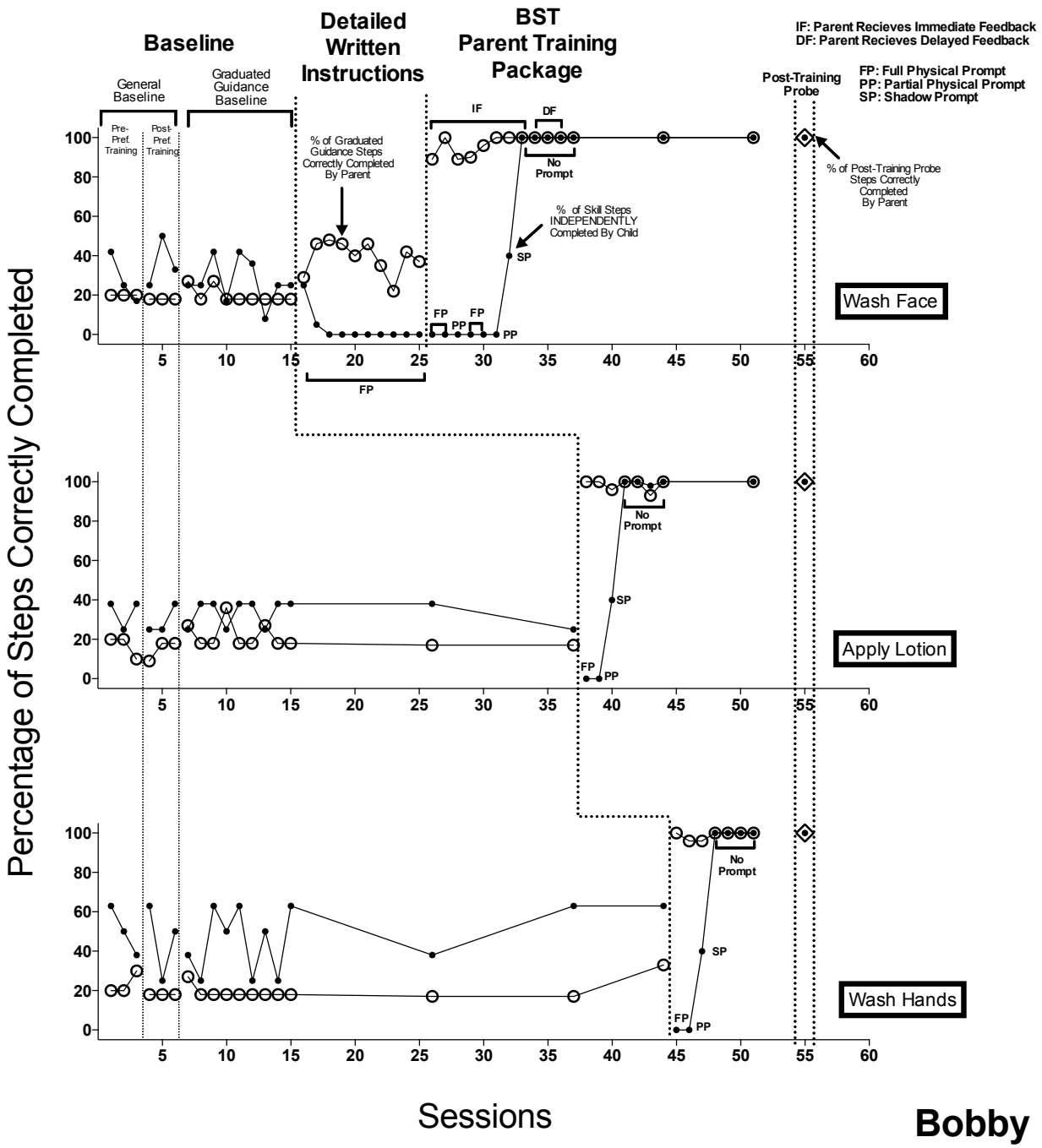

Figure 3. Results from graduated guidance training for Bobby and Bobby's mother across self-care skills

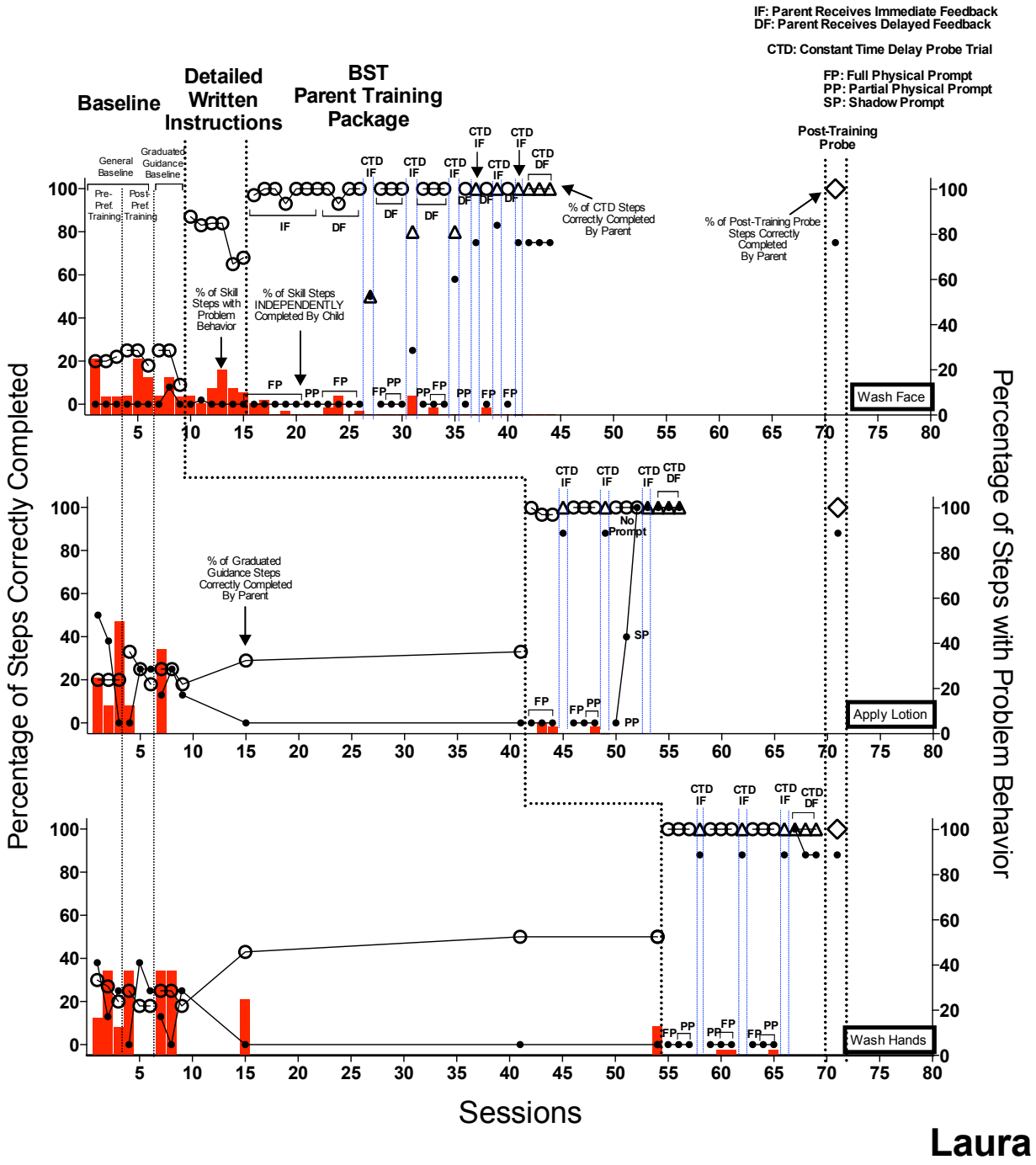

Figure 4. Results from graduated guidance training for Laura and Laura's mother across self-care skills

Appendix A-Comprehensive Review of the Use of Telehealth in Parent Training

The Use of Telehealth in Parent Training

The purpose of this paper is to review the most recent experimental investigations evaluating the use of telehealth technology in parent training. Furthermore, I propose a study that extends research in this area by using telehealth technology involving BST and remote coaching procedures to train parents of children with autism to implement a teaching program with their children that will target self-care skills.

The articles included in this review were identified by conducting searches on PsychINFO, PubMed, and GoogleScholar databases and using the following keywords: " 'Telehealth' OR 'telemedicine' OR 'telepractice' OR 'videoconferencing' AND 'parent training' OR 'parent education' ".

Moreover, I identified additional articles by reviewing the reference sections of the articles identified in the initial search.

These searches identified 182 articles. Articles from this initial pool were included in this review if:

1. The article involved at least one parent and their child.
2. The article included the use of some type of telehealth technology that enabled two-way communication between a professional and a parent (e.g., Skype, video-conferencing, telephone, email). Articles that only included distance or web-based/internet technology (e.g., web-based tutorials) that did not include two-way communication (e.g., remote coaching, teleconference) between a professional and a parent were excluded.
3. The article contained quantitative data. Review or discussion articles were excluded.
4. The article was written in English.

Telehealth Used With Parents for Purposes Other Than Teaching Parents to Implement New Skills

This review has revealed that telehealth has been used with parents for a variety of purposes. I identified 13 studies that used telehealth technologies for parent interventions but did not specifically use telehealth to teach parents to implement new skills with their children. Specifically, telehealth technology has been used to provide social support to parents and decrease parental stress when dealing with issues such as family conflicts (Glueckauf et al., 2002); being discharged early after childbirth (Lindberg, Ohrling, & Christensson, 2007; Lindberg, Christensson, & Ohrling, 2009); or living with a child with schizophrenia (e.g., Rotondi et al., 2005), developmental disabilities (e.g., Karlsudd, 2008), mental illness (e.g., Scharer et al., 2009), or type 1 diabetes (e.g., Monaghan, Hilliard, Cogen, & Streisand, 2011). Monaghan et al. (2011), for example, used telephone conferencing to deliver the Supporting Parents program to 11 parents of children with type 1 diabetes. The Supporting Parents program is aimed at increasing parents' sense of social support and reducing parental stress, anxiety, and depression. To evaluate the effects of the Supporting Parents program on parent outcomes, parents completed several pre- and post-intervention questionnaires (i.e., Center for Epidemiological Studies-Depression (CES-D), Multidimensional Scale of Perceived Social Support (MPSPSS), Pediatric Inventory for Parents (PIP)). Results from parent-completed questionnaires indicated that most parents reported decreases in parental stress and increases in social support following the completion of the program. Parents did not, however, report noticeable changes in levels of depression or anxiety following the completion of the program. Parents were also asked to discuss their satisfaction with the telehealth intervention and all parents indicated high satisfaction with both the content of the intervention program and the use

of telephone consultation. Hence, this study suggests that parents seem satisfied with the use of telehealth programs and technology to deliver parental support services.

Another interesting study that used telehealth technology to deliver supportive services to parents is Lindberg et al. (2007) in which videoconferencing was used to provide support to 22 mothers who were discharged early after childbirth. Midwives provided remote support and advice to parents in the family home through computer videoconferencing technology. Specifically, midwives remotely answered any questions parents had regarding their child, themselves, breastfeeding, or anything related to childbirth. To evaluate the feasibility of delivering a telehealth program, the midwives completed a 12-question questionnaire after each telehealth session. The questionnaire asked midwives to rate various aspects of the technology (e.g., sound quality) and the program overall (e.g., ability to assess problems or needs of parents) on a 4-point scale with "1" being "very bad" and "4" being "very good". Results from these questionnaires showed that most midwives rated aspects of the videoconferencing technology (e.g., sound quality, color quality, quality of definition, quality of movements) as "good" or "very good". Also, the majority of midwives rated the possibility of assessing parents' needs as "good" and the ability to experience "contact" with parents as "very good". This study further supports the use of telehealth in delivering supportive services to parents by demonstrating that service providers also appear to be satisfied with the use of telehealth interventions.

Telehealth has also been used by professionals to consult with parents and provide information about issues such as special childhood health care needs (Marcin et al., 2004), childhood cancer (Goodenough & Cohn, 2004), pediatric asthma management (Reznik, Sharif, & Ozuah, 2004; Slack, Kreps, Dalan, & Patolia, 2012), and pediatric feeding disorders (Clawson et al., 2008). Reznik et al. (2004), for example, used real-time videoconferencing technology to

deliver an asthma education program to 60 parents of children with asthma. During two 90 min telehealth sessions (session A and session B), the authors discussed asthma triggers (session A), asthma exacerbation prevention (session A), and the proper use of asthma medications (session B) with parents. To evaluate the effects of the asthma education program on parental asthma knowledge, parents completed true/false questionnaires about the information delivered during telehealth sessions before and after each telehealth session. The authors found that parental asthma knowledge substantially increased following both telehealth sessions and maintained at high levels at a 3-month follow-up. Similarly, Clawson et al. (2008) used videoconferencing technology to consult with 15 parents of children with complex feeding disorders. During videoconferences, health care professionals conducted initial screenings and provided appropriate treatment recommendations. Following videoconferencing sessions, parents completed a questionnaire that asked them to rate their comfort and satisfaction with the telehealth intervention on a 5-point scale with "1" being the worst rating and "5" being the best rating. Results from these questionnaires indicated that the mean "satisfaction" rating was 4.4 and the mean "comfort" rating was 4. Hence, these studies indicate that telehealth technology can be used to effectively consult with parents and increase parents' knowledge about important information related to their children.

Additionally, telehealth has been used to help parents accurately describe the condition of their children's burns through pictures and text (Johansen et al., 2004). Specifically, four parents of pediatric burn patients were taught to use digital cameras to capture images of their children's burns and then email the images to a pediatric burn team and provide additional information regarding the burn in the text portion of the email. After receiving the email, the burn team provided diagnoses and recommendations for follow-up care to parents via email. Parents sent

emails to the pediatric burn team once a week for the first two months and then once a month for the following four months. The burn team reported that 30 of the 32 email messages (94%) from parents contained burn images and burn information that were suitable and adequate for making clinical decisions regarding the children's burns. All of the parents also reported that they were "happy" with the telehealth intervention and felt that capturing burn images was "easy" and "convenient".

Research in the area of using telehealth to educate or consult with parents indicates that both parents and service providers appear to be capable, comfortable, and satisfied with the use of telehealth technology in addressing child-related issues. Accordingly, research in this area supports of use of telehealth technology within parent training and education programs.

Telehealth Used to Teach Parents to Implement New Skills

Research has also shown that telehealth technology can be effectively used to teach parents to implement new skills with their children. Specifically, I identified 17 studies that used telehealth procedures to teach parents new skills. All 17 of these studies used some form of BST training procedures (i.e., two or more components of BST) to teach parents. This review indicated that telehealth has been used to teach parents to implement the Triple P Positive Parenting Program for children with ADHD (Reese, Slone, Soares, & Sprang, 2012), behavioral treatments (e.g., building positive relationships, issuing effective commands, implementing a home token economy, using time out) for children with ADHD (Xie et al., 2013), naturalistic language interventions for children with neurodevelopmental disorders (McDuffie et al., 2013), positive parenting programs for children with pediatric traumatic brain injuries (Wade, Oberjohn, Burkhardt, & Greenberg, 2009; Antonini, Raj, Oberjohn, & Wade, 2012), problem solving procedures (Wade et al., 2012), interventions to increase functional motor skills for children with

developmental coordination disorder (Miyahara, Butson, Cutfield, Pthy, & Clarkson, 2009), social-emotional development interventions for children at risk for poor social-developmental outcomes (Baggett et al., 2010), speech and language interventions (McCullough, 2001), and interventions for children with autism or developmental disabilities (DD) (e.g., Kelso, Fiechtl, Olsen, & Rule, 2009; Vivian, Hutchins, & Prelock, 2012; Baharav & Reiser, 2010; Olsen, Fiechtl, & Rule, 2012; Wacker et al., 2013a; Wacker et al., 2013b; Vismara, Young, & Rogers, 2012; Vismara, McCormick, Young, Nadhan, & Monlux, 2013).

Telehealth parent training studies that used BST without performance feedback. Of the 17 studies that used telehealth technology to teach parents new skills, two studies (Miyahara et al., 2004; Xie et al., 2013) used BST procedures to teach parents but did not include performance feedback on parent implementation of skills. Specifically, Miyahara et al. (2004) used written instructions, video models of targeted skills, self-monitored homework assignments, and weekly telephone consultations with a pediatric physiotherapist to teach 11 parents to implement a family-focused intervention to improve the motor capabilities (e.g., tying shoelaces, riding a bike without training wheels, engaging in sports skills) of their child with a developmental coordination disorder. During weekly telephone consultations, parents discussed their implementation of targeted skills at home and received support and procedural recommendations from a pediatric physiotherapist. Similarly, Xie et al. (2013) taught nine parents to implement an intervention for their child with ADHD aimed at improving parent-child interactions, increasing child social skills, and decreasing child ADHD symptoms (e.g., inattention, hyperactivity, oppositional defiant behaviors). Parents were taught to implement the intervention through real-time videoconferencing that involved therapists providing instructions, models of targeted skills, and homework assignments for parents to complete at home with their

children to practice targeted skills. Thus, neither Miyahara et al. nor Xie et al. included the delivery of feedback to parents on their implementation of skills during parent training. Additionally, neither study included direct measures of parent or child behavior; both studies used parent report measures (e.g., parent report of child's functional motor skills, parent perception of ADHD symptoms) as the main child outcome measures. Miyahara et al., however, did complete the Movement Assessment Battery for Children, Version 2 (MABC-2) and the Developmental Coordination Disorder Questionnaire (DCDQ) before and after the parent-implemented intervention, yet, it is unclear whether increases in these scores for a few of the children reflected changes in child skills that were targeted during the parent-implemented intervention. Therefore, although parents in both of these studies reported improvements in child behavior (i.e., increases in motor skills, decreases in ADHD symptoms) after the telehealth intervention, without any direct measures of targeted child behaviors, we cannot be completely confident that these parent training interventions actually produced improved child outcomes. Furthermore, because neither study collected data on parent implementation of skills, the effectiveness of the telehealth parent training intervention in teaching these parents new skills is also unknown.

Telehealth parent training studies that used BST with performance feedback. The remaining 15 studies that used telehealth to teach parents new skills, involved some combination of BST procedures (e.g., written or live instructions, modeling, role play) combined with either remote, delayed feedback on parent skill implementation (Baggett et al., 2010; Vivian, Hutchins, & Prelock, 2012) or remote, real-time feedback and coaching on parent skill implementation (McDuffie et al., 2013; Reese, Slone, & Soares, 2012; Kelso, Fiechtl, Olsen, & Rule, 2009; Baharav & Reiser, 2010; Antonioni et al., 2012; Olsen, Fiechtl, & Rule, 2012; Wacker et al.,

2013a; Wacker et al., 2013b; Vismara, Young, & Rogers, 2012; Vismara, McCormick, Young, Nadhan, & Monlux, 2013; Wade, Oberjohn, Burkhardt, & Greenberg, 2009; Wade et al., 2012; McCullough, 2001).

Telehealth parent training studies that used BST with delayed performance feedback. Telehealth interventions involving BST with delayed feedback procedures typically involve parents videotaping themselves implementing skills with their children, sending those videos to service providers via standard mail or email, and service providers later contacting parents to give feedback on parent implementation of skills. Baggett et al. (2010) evaluated the effectiveness of an internet-based parent training program (Infant Net) that is aimed at increasing infant social engagement and environmental engagement. In this study, 40 parents of infants at risk for poor social-emotional outcomes used the Infant Net online program to access written information about targeted interaction strategies (e.g., positive affect, warmth, positive verbal content), view video examples of parents implementing interaction strategies, and create 5-min computer-collected videos of themselves implementing interaction strategies with their children to be later remotely co-reviewed with intervention "coaches". During weekly telephone calls, intervention coaches discussed the 5-min videos with parents and provided feedback on parent implementation of interaction strategies. The authors collected data on parent and child behavior from the 5-min videos and found that both parent implementation of intervention strategies and child engagement increased only slightly following the Infant Net intervention. The lack of substantial changes in parent and child behavior may have been partially due to the fact that feedback on parent implementation was delayed rather than occurring immediately after parent demonstration of skills.

Similarly, Vivian, Hutchins, and Prelock (2012) used videotaped delayed feedback procedures to teach two parents to implement a social skills intervention, comic strip conversations (CSC), with their child with autism. Specifically, parents were first given written instructions and a DVD with video models demonstrating a CSC and then researchers demonstrated the implementation of a CSC with the child in the family home. Next, parents video recorded their implementation of the CSCs, mailed videos to the researchers, and later received feedback on their implementation of procedures from researchers via telephone call or email correspondence. The authors did not present any data on parent implementation of CSCs or child behavior, yet, reported that parents were able to successfully implement CSCs and that the parents believed that implementing CSCs helped promote their child's appropriate behaviors and social understanding. Once again, however, the absence of direct measures of either parent or child behavior makes the validity of these reported outcomes questionable.

Telehealth parent training studies that used BST with real-time coaching and immediate performance feedback. Conversely, telehealth interventions that consist of BST procedures with immediate feedback and remote coaching on skill implementation involve the use of technologies (e.g., Skype, videoconferencing, video phones) that enable real-time communication between parents and professionals such that professionals can observe parents implementing targeted skills and provide real-time coaching on parent implementation of skills. This review identified 13 studies that used telehealth technology to deliver BST and real-time coaching to teach parents new skills.

No direct measures of parent or child behavior. Of these 13 studies that used BST and immediate feedback procedures to teach parents, six studies did not include direct measures of parent or child behavior (McCullough, 2001; Kelso et al., 2009; Antonini et al., 2012; Olsen et

al., 2012; Reese et al., 2012; Wade et al., 2012). These six studies appeared to be primarily focused on evaluating the feasibility of using telehealth technology involving BST and remote coaching to teach parent new skills. These six studies also primarily relied on parent report measures (e.g., parent-completed surveys) to assess the effects of the parent training interventions. Specifically, McCullough (2001) evaluated the feasibility of using telehealth to teach four parents to implement a speech and language therapy intervention with their children with DD. Participants' homes were equipped with a Motion media Setop box/PTZ camera to enable telehealth therapy sessions between parents and speech-language therapists. During sessions, therapists observed parents communicate with their children and offered feedback on therapy implementation. The authors administered surveys to parents and speech and language therapists before, during, and after the study to collect data on user satisfaction, reliability of the technology, visual and audio quality, and perceived improvement in child communication skills. Respondents were asked to answer questions using a 5-point scale with "1" being the worst rating and "5" being the best rating. Results indicated that the mean rated score for "reliability of technology" (i.e., tendency for technology to "breakdown") was 4.7 for the parents and 4.4 for the speech and language therapists, both parents and speech and language therapists rated the visual and audio quality above 4.0, and the mean rated score for child improvement perceived by parents was 4.7. Although parents reported improvements in their children's communication skills, there were no direct measures taken of child communication behaviors to verify these reports. Furthermore, the fidelity with which parents were able to implement the speech-language intervention in unknown because no direct measures were taken of parent implementation of skills.

More recently, Kelso et al. (2009) evaluated the feasibility of using remote coaching and videoconferencing technology to deliver early intervention services to four families of children with DD in the family home. Specifically, parents used laptops, webcams, and Bluetooth ear buds to participate in remote therapy sessions with interventionists that were located in a clinical facility. During remote therapy sessions, interventionists provided parents with instructions on how to implement targeted procedures with their children, observed parents implementing procedures with their children, and provided coaching in the form of on-going positive and corrective feedback on parent implementation of procedures. The primary dependent measures in this study were parental satisfaction with the telehealth intervention and perceived usability of videoconferencing technology. To evaluate these variables, parents rated (a) their satisfaction with intervention on a 4-point scale with "1" being "satisfied" and "4" being "dissatisfied" and (b) their opinion on the usability of technology on a 4-point scale with "1" being "very easy" and "4" being "very difficult". Results indicated that parents' mean rating for "satisfaction" with the intervention was 2.7 with parents either reporting that they were "somewhat satisfied" or "somewhat unsatisfied". With respect to "usability," the parents' mean rating was 2.0 with parents generally reporting that the technology was "very easy" or "somewhat easy" to use. The effects of the telehealth parent training program, however, on parent implementation of early intervention procedures is unknown because no direct measures were taken of parent implementation of procedures. Furthermore, the effects of the parent-implemented early intervention program on child outcomes is unknown because no direct measures were taken of child behavior.

Similarly, Olsen et al. (2012) evaluated the feasibility of using videoconferencing to provide early intervention services over the course of two years to 14 parents of children with

DD in year one of the study and 17 parents of children with DD in year two of the study. Participants' homes were equipped with laptops, webcams, and speakers or microphones to allow service providers (e.g., physical therapists, occupational therapists, speech-language pathologists) to remotely coach parents on their implementation of skills related to their child's Individual Family Service Plan (IFSP). During telehealth sessions, service providers modeled targeted skills, observed parents implementing skills with their children, and provided on-going positive and corrective feedback on parent implementation of skills. To assess parental comfort and satisfaction with technology, parents were asked to compete surveys that asked them rate their satisfaction and comfort with the telehealth technology on a 4-point Likert scale with "4" being the highest rating and "1" being the lowest rating. Parent surveys were distributed several times throughout the course of the study. Results from parent surveys from year one of the study revealed that the mean rating for "parental comfort" with technology was 3.7 before the telehealth intervention and 3.5 after the telehealth intervention. Results from year two, however, indicated that the mean rating for "parental comfort" with technology was 3.4 before the telehealth intervention and 3.6 after the telehealth intervention. The effects of the telehealth training program on parent implementation of early intervention procedures or child outcomes are unknown, however, because no direct measures were taken of either parent implementation of skills or child behavior.

Antonini et al. (2012) assessed the feasibility and parental satisfaction with an online, telehealth positive parent training program, I-InTERACT, for 20 parents of children with traumatic brain injuries (TBI). Specifically, the I-InTERACT program consisted of parents (a) completing online, self-guided information sessions on targeted skills (e.g., positive parenting skills, staying positive and dealing with stress, behavior management) that involved written

instructions, video models of other parents implementing targeted skills, and practice exercises for parents to complete with their children at home and (b) participating in Skype videoconferencing sessions with therapists during which parents discussed the information presented during online information sessions, role played skills with the therapist, and received remote coaching from the therapist on their implementation of targeted skills with their children. At the conclusion on the study, parents were asked to complete a 35-item survey regarding their satisfaction with the telehealth technology and the I-InTERACT program. The survey asked parents to rate if they "strongly agreed," "agreed," "disagreed," or "strongly disagreed" with statements about the I-InTERACT program and the use of technology. Results indicated that 87% of parents reported that the videoconferencing sessions were "helpful" compared to telephone calls and in-person office sessions. Additionally, 80% of parents reported that videoconferencing sessions were "easy" compared to telephone calls and in-person office sessions. Once again, the effects of the telehealth parent training intervention on parent implementation of skills and child outcomes is unclear due to the absence of direct measures of parent or child behavior.

In a similar study, Wade et al. (2012) used online training modules and videoconferencing to teach 20 parents of adolescents with traumatic brain injury to implement problem solving strategies via the Teen Online Problem Solving (TOPS) intervention. In this study, 20 parents were randomly assigned to receive the TOPS intervention and 20 parents were randomly assigned to receive the Internet Resource Comparison (IRC) intervention. The IRC intervention simply involved providing parents with access to a variety of online brain injury resources (e.g., website for the Center on Brain Injury Research and Training, website for Brain Injury Partners). Conversely, the TOPS intervention involved (a) parents and adolescents

completing online information sessions that consisted of written descriptions of targeted skills, video models of teens and parents implementing targeted skills, and practice exercises for parents and adolescents to implement at home and (b) parents participating in videoconferencing sessions with therapists during which parents received coaching on their implementation of the problem solving procedure.

In this study, pre- and post-intervention measures were completed to assess the effects of the TOPS and IRC interventions on parent behavior. Specifically, parents completed a satisfaction survey that asked them to rate their satisfaction with various aspects of the intervention (e.g., helpfulness of program overall and in working with child, enjoyment of program) on a 10-point Likert scale with "1" being "not at all satisfied" and "10" being "extremely satisfied". Results indicated that the TOPS parents rated the overall program as significantly more "helpful" (mean rating of 8.93) than the IRC parents (mean rating of 5.25), the TOPS parents rated the program as more "helpful" in teaching them to work with their child (mean rating of 9.00) than the IRC parents (mean rating of 5.13), and the TOPS parents rated the program as more "enjoyable" (mean rating of 9.13) than the IRC parents (mean rating of 6.00). Additionally, parents were asked to complete the Social Problem Solving Inventory-Revised Short Form questionnaire (SPSI-R:S) to assess changes in parents' problem solving ability from baseline to follow-up. Interestingly, only the TOPS parents with lower socioeconomic status (SES) reported improvements in their problem solving skills from baseline to follow-up; no differences in problem solving ability from baseline to follow-up were reported by TOPS parents with higher SES, IRC parents with lower SES, or IRC parents with higher SES. Once again, although some parents reported improvements in their problem solving abilities following the TOPS intervention, no direct measures were taken of parent implementation of problem solving

skills to confirm these effects. Additionally, the effect of the parent-implemented problem solving program on adolescent behavior is also unknown because no direct measures were taken of adolescent behavior.

Finally, Reese et al. (2012) used videoconferencing to deliver the Group Triple P Positive Parenting Program to eight parents of children with ADHD. The goal of the Group Triple P Positive Parenting Program is to teach parents to implement skills to decrease oppositional child behavior and parental stress and increase parental self-efficacy. Parents received the behavioral parenting program during videoconferencing sessions that they attended at a regional medical center. The parenting program was remotely delivered to parents by several service providers who were located at a different facility. To evaluate the effects of the parent training program, parents competed the (a) Child Behavior Checklist (CBCL) to assess changes in child problem behavior, (b) Being a Parent Scale (BPS) to evaluate changes in parents' sense of self-efficacy, and (c) the Depression Anxiety Stress Scales-21 (DASS-21) to assess changes in parental stress. All measures were competed pre- and post-intervention. Results indicated that most parents reported some improvements in child behavior (effect size of d = -1.23) and small decreases in parental stress (effect size of d = -0.34) over the course of the study. These effects cannot be confirmed, however, because no direct measures were taken of parent or child behavior.

Thus, although these six studies provide support for the feasibility of using telehealth technology to teach parents, they do not provide evidence supporting the effectiveness of telehealth parent training interventions in teaching parents to successfully implement new skills because no direct measures were taken of parent implementation of targeted skills or child outcomes.

Direct measures of either parent or child behavior. Three of the 13 studies that used BST and real-time coaching procedures to teach parents new skills, however, did include direct measures of either parent or child behavior (Wade et al., 2009; Baharav & Reiser, 2010; Wacker et al., 2013b). Wade et al. (2009) evaluated the effectiveness of a web-based parent training program that included self-directed didactic information, video models of targeted skills, and real-time, remote coaching sessions. Specifically, nine parents of children with TBI participated in the Internet-based Interacting Together Everyday, Recovery After Childhood TBI (I-InTERACT) parent training program that is aimed at increasing positive parenting skills (e.g., positive parenting skills, staying positive, behavior management, parent-directed interaction, dealing with anger, time-out). Parents completed 10 web sessions that included didactic information regarding targeted parent skills, video models of targeted parent skills, and suggested practice exercises for parents to implement with their children at home. Following each web session, therapists met with parents through Skype videoconferencing technology to discuss information from web sessions (15-20 min), observe and collect data on parents implementing targeted skills with their children (5 min), and provide coaching (positive and corrective feedback) on parent implementation of skills (20-30 min).

In this study, the authors measured and compared the frequency of positive (e.g., behavioral descriptions, specific praise, reflections) and negative (e.g., criticism, commands) parent behaviors during parent-child interactions across baseline, intervention, and post-intervention to evaluate the effectiveness of the parent training intervention on parent implementation of skills. Data on these dependent measures were recorded during the 5-min data collection and observation period during videoconferencing sessions. Results indicated that positive parent behaviors increased (mean at baseline = 3.09, mean following intervention =

17.29) and negative parent behaviors decreased (mean at baseline = 31.64, mean following intervention = 6.29) over the course of the study. A limitation to this study, however, is the fact that the authors did not report whether interobserver agreement (IOA) assessment procedures were completed for the dependent measures. Another limitation to this study is that there were no direct measures of child behavior; the only measure of child behavior was parent completion of the Eyberg Child Behavior Inventory (ECBI) that asks parents to rate the frequency and intensity of 36 disruptive behaviors in the home on a 7-point scale ("1" being the lowest rating and "7" being the highest rating). Thus, it is unclear how effective the parent-implemented intervention was on actual child outcomes (e.g., child problem behavior). Results from parent completed ECBI surveys, however, suggested that most parents reported some reductions in the frequency of child disruptive behaviors over the course of the study (mean at baseline = 65.20, mean following the intervention = 55.80). Yet, parent ratings related to the severity of child disruptive behavior only slightly decreased over the course of the study (mean at baseline = 60.50, mean following the intervention = 56.92).

Baharav and Reiser (2010) conducted a pilot study that compared the traditional clinical model of twice-weekly, therapist-implemented speech-language therapy sessions to a clinical/telehealth model in which once-a-week, therapist-implemented speech-language therapy sessions were followed by remotely monitored parent-implemented speech-language therapy sessions in the family home. Specifically, two parents of children with autism were given a laptop, web camera, and a wireless Bluetooth headset. Clinicians used Skype to remotely observe and coach parents on their implementation of a speech-language intervention aimed at increasing social and communication interactions between parents and their children. The authors measured and compared the frequency of child communication initiations and responses

across traditional clinic sessions and clinic/telehealth sessions using a single-subject time-series (A-B) repeated measures design. The authors evaluated IOA on the dependent measures and obtained acceptable levels of agreement (i.e., above 80% agreement) for all measures. Although results from this study indicated that children demonstrated moderate gains in appropriate communication over the course of the study (e.g., one child's verbal responses at home increased from around 25% of opportunities before home-based sessions to around 61% of opportunities following home-based sessions) the fact that parent-implemented sessions always followed therapist-implemented sessions makes these results questionable because these changes may have been due to sequence or practice effects. An additional limitation to this study is the fact that the authors did not collect any data on parent implementation of the intervention procedures. Due to the lack of direct measures of parent behavior, it is unclear how effective the telehealth parent training program was in teaching parents to correctly implement the speech-language intervention with their children.

Finally, Wacker et al. (2013b) taught 17 parents of children with autism who displayed problem behavior to conduct functional communication training (FCT) through weekly telehealth sessions that involved remote coaching. Parents brought their children to a regional clinic. Behavior analysts, who were located in a different facility, used computers, web cameras, and audio headsets, to coach the parents to implement FCT procedures. The behavior analysts taught parents to implement FCT by providing the parents with a written manual that described FCT, modeling the FCT procedure during telehealth sessions, and providing remote coaching on the parents' implementation of FCT procedures during telehealth sessions. Data were collected on child problem behavior and evaluated using a nonconcurrent multiple baseline across participants design. The authors also evaluated IOA and obtained acceptable levels of agreement

(i.e., above 85% agreement) for all dependent measures. The authors found that parents could be taught to implement FCT procedures through telehealth technology and that child problem behavior was reduced by an average of 93.5%. A limitation to this study, however, is that the authors did not report whether they took data on the fidelity with which parents implemented the FCT procedures. Thus, the effectiveness of the telehealth parent training intervention on parent implementation of FCT procedures is unclear. An additional limitation with this study is the fact that parents were remotely coached to implement FCT procedures in a clinical environment; thus, it is unknown whether the parents would have been able to successfully implement FCT procedures in the natural environment (e.g., family home).

Direct measures of both parent and child behavior. Finally, four of the 13 studies that used telehealth technology involving BST and real-time coaching procedures to teach parents included direct measures of both parent and child behavior (Vismara et al., 2012; Vismara et al. 2013; McDuffie et al., 2013; Wacker et al., 2013a). Specifically, McDuffie et al. (2013) evaluated the effectiveness of live BST procedures and remote videoconferencing in teaching eight parents of children with ASD to implement a naturalistic language intervention. The parent training intervention consisted of four monthly face-to-face parent education sessions that were conducted at a university clinic and involved written instructions, live PowerPoint presentations that described the language intervention and provided video models of targeted parent skills, and face-to-face coaching sessions during which an interventionist observed parents implementing targeted skills with their children and provided positive and corrective feedback on parent implementation of skills. Parents were taught four sets of skills (i.e., managing child attention and increasing engagement, using prompting and contingent verbal responding strategies, enhancing play activities, using question asking and book reading to increase child

communication) throughout the study, and each education session focused on teaching parents a different set of skills. In addition, 12 remote parent coaching sessions were conducted (one session held per week during the three weeks after each parent education session) using videoconferencing equipment that consisted of a laptop computer and web cameras. During remote coaching sessions, interventionists observed parents implementing targeted skills with their children at home and provided positive and corrective feedback on parent implementation of skills.

A series of A-B replications were used to assess the effects of this parent training intervention package on parent and child behavior. Data were collected on child communication acts and parent implementation of responsive verbal strategies (i.e., responding to child communication attempts, prompting child communication, contingent verbal responses) during 10-min parent/child play samples that occurred at the mid-point of each remote coaching session. IOA was assessed for each dependent measure and satisfactory levels of agreement (i.e., above 79% agreement) were reported for all dependent measures. Results indicated that parent implementation of targeted skills (i.e., responding to child communication attempts, prompting child communication, contingent verbal responses) increased (i.e., changes in the mean frequency of parent prompts from baseline to post-intervention ranged from 3.75 to 28.18, changes in the mean frequency of parent contingent responses from baseline to post-intervention ranged from 6.30 to 31.33) for all parents following the intervention and maintained at elevated levels through the course of the study. Furthermore, the mean frequency of child total communication acts substantially increased (i.e., changes in the mean frequency of child total communication acts from baseline to post-intervention ranged from 7.96 to 42.2) following the intervention. Finally, the authors found that parents implemented the targeted skills with the

same frequency during face-to-face coaching sessions as they did during distance coaching sessions, thus, suggesting that distance coaching may be equally effective in teaching parents to implement new skills as face-to-face coaching. Unfortunately, remote coaching sessions for each set of skills were always conducted after face-to-face coaching sessions, therefore, it is unclear whether parent behavior during remote coaching sessions was a result of practice or sequence effects. Furthermore, because this study used a multi-component parent training intervention package that involved both live and remote training procedures, it is unknown whether remote training procedures alone would have been as successful in teaching parents as using a combination of face-to-face and remote training procedures. Also, the A-B experimental design does not provide a strong demonstration of experimental control. A final limitation to this study is the fact that the authors only reported parent and child outcome measures for one set of targeted parent skills (i.e., responsive verbal strategies). Thus, it is unknown how effective the parent training program was for parent and child outcomes related to the other sets of targeted parent skills (e.g., use of preferred activities and noncontingent reinforcement to increase child engagement in play, use of indirect prompting strategies, expanding and modeling new play actions, use of questions to prompt child communication acts).

Wacker et al. (2013a) tested the effectiveness of telehealth in teaching 20 parents of children with autism who displayed problem behavior to implement functional analyses (FAs). Using BST and remote coaching procedures, behavior analysts taught parents to conduct FAs with their children at a regional clinic. The behavior analysts were located at a different facility and coached parents to implement FA procedures using computers, web cameras, and audio headsets. The authors collected data on child problem behavior and parent implementation of FA procedures. IOA was also assessed for all dependent measures and acceptable levels of

agreement (i.e., above 85% agreement) were obtained for all dependent measures. Parents were taught to conduct FAs within a multielement design and results indicated that all 20 parents were able to implement FA procedures with high levels of integrity (i.e., over 95%) and able to identify the environmental variables that maintained problem behavior for 18 of the 20 children. A limitation to this study, however, is that parents conducted all procedures in a regional clinic; thus, it is unknown if they would have been as successful implementing FAs if procedures had been conducted in the natural environment (e.g., family home). Additionally, data on parent implementation of FAs were only collected during the midpoint of the FA; no baseline data were collected on parent implementation of FAs. Thus, the effects of the telehealth intervention and remote coaching on parent implementation of FAs is unclear because the fidelity with which parents implemented FAs prior to parent training is unknown. On a related note, although the authors evaluated the effects of parent-implemented FAs on child problem behavior within a multielement design (i.e., providing a convincing demonstration of experimental control of FA procedures), the effects of the telehealth parent training intervention on parent implementation of FAs was not evaluated within an experimental design (e.g., multiple baseline design). As a result, there was not a convincing demonstration of experimental control of parent training procedures.

Vismara, Young, and Rogers (2012) evaluated the effectiveness of telehealth technology in the delivery of a parent training intervention based on the Early Start Denver Model (ESDM) for parents of children with autism in the family home. The authors remotely delivered a 12 one-hour per-week parent intervention program to nine parents of children with autism. Parents were taught to promote their children's functional language and imitation skills during play and caretaking moments at home. The telehealth intervention consisted of having parents (a) watch a

DVD that outlined each topic and included examples of trained therapists modeling each topic and (b) participate in real-time videoconferencing sessions with a trained therapist using laptops with web cameras. During videoconferencing sessions, parents received real-time remote coaching and feedback on their implementation of procedures with their children.

The authors measured and compared parent implementation of skills (measured using a 5-point Likert scale with "1" being "no competent teaching" and "5" being "extremely competent teaching) and child social communication behaviors (i.e., (1) spontaneous and prompted functional verbalizations and (2) imitative gestures and play actions) across baseline, intervention, and follow-up (i.e., three, bi-weekly follow sessions) using a multiple baseline across participants design. Data were collected on parent and child behavior during 10-min parent/child play samples during each videoconferencing session. The authors also evaluated IOA for all dependent measures and obtained acceptable levels of agreement (i.e., above 85% agreement) for all measures.

The data showed that parent implementation of procedures increased during the parent training intervention and maintained at high levels throughout the course of the study and through follow-up (i.e., mean fidelity rating at baseline = 2.62, mean fidelity rating at follow-up = 4.29). Although most children demonstrated substantial increases in spontaneous and prompted functional verbalizations following the intervention and maintained the increase throughout the study and follow-up (i.e., mean frequency of spontaneous verbalizations at baseline = 3.44, mean frequency of spontaneous verbalizations at follow-up = 29.86, mean frequency of prompted verbalizations at baseline = 1.89, mean frequency of prompted verbalizations at follow-up = 14.57), the number of imitative gestures and play actions increased only modestly for some children and appeared to decrease slightly during follow-up (i.e., mean

frequency of spontaneous imitative play gestures and actions at baseline = 0.44, mean frequency of spontaneous imitative play gestures and actions at follow-up = 6.57). The modest effects of parent-implemented ESDM strategies on child imitative behavior may actually be, however, a reflection of the ESDM procedure itself because other studies that evaluated the effectiveness of parent-implemented and therapist-implemented ESDM strategies on increasing child imitative behaviors (e.g., Vismara & Rogers, 2008; Vismara, Colombi, & Rogers, 2009; Vismara et al. 2009; Rogers et al., 2012) found similarly small effects on the frequency of child imitative behaviors following the intervention. A notable strength of this study, however, is the use of a multiple baseline across participants design to evaluate the effects of the parent training intervention on parent implementation of skills because it provided a strong demonstration of experimental control of parent training procedures.

Vismara, McCormick, Young, Nadhan, and Monlux (2013) later expanded upon their previous study and evaluated the effectiveness of remote videoconferencing and a self-directed website (instead of DVDs) to deliver a parent training intervention in the natural environment to eight parents of children with autism. Parents were taught to implement several skills from the parent model of the Early Start Denver Model (P-ESDM) that is designed to increase parent-child engagement and promote children's functional verbal language and joint attention initiations during daily activities and interactions. The P-ESDM self-directed website provided step-by-step instructions and rationales for each skill, video models of each skill, and suggested practice exercises for parents to complete with their children at home. Parents also participated in remote coaching sessions once per week for 12 weeks that involved the use of laptop computers, web cameras, and wireless Bluetooth headsets. Weekly remote coaching sessions consisted of the therapist first observing a 10-min parent-child play interaction to collect data on

parent implementation of learned skills and child behavior. Therapists then verbally described the next parent skill, reviewed corresponding website materials, and coached (provided positive and corrective feedback) parents as they implemented the skills with their children.

The authors collected data on parent implementation of skills (measured using a 5-point Likert scale with "1" being "no competent teaching" and "5" being "extremely competent teaching") and child social and communicative behaviors (i.e., functional verbal utterances and nonverbal joint attention initiations) across baseline, intervention, and follow-up (i.e., 3, monthly follow-up sessions) using a multiple baseline across participants design. All data on parent and child behavior were recorded during the 10-min parent/child play interaction sample during each videoconferencing session. The authors also assessed IOA for all dependent measures and obtained acceptable levels of agreement (i.e., above 85% agreement) for all measures.

Once again, results indicated that parents' fidelity of program implementation increased following the parent training intervention (i.e., mean fidelity rating at baseline = 2.93, mean fidelity rating following the intervention = 3.68) and remained at high levels throughout the study and at follow-up (i.e., mean fidelity rating at follow-up = 4.15). Unlike previous studies that assessed the effectiveness of parent-implemented and therapists-implemented ESDM procedures on the rate of child functional verbalizations (e.g., Vismara et al., 2009; Vismara et al., 2012) and found substantial increases in child functional verbalizations following the intervention, results from this study indicated that the rate of child functional verbal utterances (i.e., mean rate of vocalizations at baseline = 2.97, mean rate of vocalizations following the intervention = 3.60) increased only slightly after parent implementation of P-ESDM skills. Furthermore, the rate of functional verbal utterances appeared to decrease at follow-up for some children (i.e., mean rate of vocalizations at follow-up = 4.14). Additionally, the rate of joint

attention initiations did not increase following the intervention (i.e., mean rate of joint attention initiations at baseline = 1.67, mean rate of joint attention initiations following the intervention = 1.67), yet, appeared to increase slightly at follow-up (i.e., mean rate of joint attention initiations at follow-up = 2.16). No studies have assessed the effectiveness of ESDM procedures on increasing child joint attention initiations, thus, it is unknown whether the lack of substantial changes in child joint attention initiations is a result of the ESDM procedure itself or other unknown variables. Once again, however, a notable strength of this study is the use of a multiple baseline across participants (i.e., parent-child dyads) design because it provided a strong demonstration of experimental control of parent training procedures.

Appendix B-Task Analyses of Self-Care Skills

WASH FACE:

1. Get wash cloth
2. Turn on water
3. Wet wash cloth
4. Squeeze wash cloth
5. Pump soap into wash cloth 1x
6. Lift wash cloth to face
7. Rub wash cloth on face for at least 5 s
8. Rinse wash cloth with water
9. Lift wash cloth to face
10. Rub wash cloth on face for at least 5 s
11. Turn off water
12. Pat face with dry towel

APPLY LOTION:

1. Pick up lotion
2. Uncap lotion
3. Squeeze at least a dime- sized amount of lotion into hands
4. Rub palms together
5. Rub top of 1 hand
6. Rub top of other hand
7. Rub face
8. Cap lotion

WASH HANDS:

1. Turn on water
2. Pump soap into hand one time
3. Rub palms together
4. Rub top of one hand
5. Rub top of other hand
6. Rinse hands
7. Turn off water
8. Dry hands with towel

Appendix C- Teaching Parent Behavior Checklist for Conducting a Preference Assessment

Teaching Parent Behavior Checklist Data Sheet

PARENT PREFERENCE ASSESSMENT		
Skill Steps	Parent Behavior	Child Behavior
1. Presents child with an array of at least 5 items in a straight line and approximately 5 cm apart	Y N	Edible Items Presented: 1. _____ 2. _____ 3. _____ 4. _____ 5. _____
2. Instructs child to select an item	Y N	Order of Selection: 1. _____ 2. _____ 3. _____ 4. _____ 5. _____
3. Blocks any attempts to choose more than 1 item	Y N NA	
4. Removes chosen item from array	Y N	
5. Allows child to consume item	Y N	
6. Takes item from left end of line and moves it to the right end of the line	Y N	
7. Shifts remaining such that they are evenly spaced on the table	Y N	
8. Repeats steps 2-6 until all items have been selected or child does not make a selection within 30 s of asked to do so	Y N	

Appendix D- Teaching Parent Behavior Checklist for the Graduated Guidance Teaching Procedure

Date: **Primary Observer:**
Child Initial: **IOA Observer:**
Session Number:

Skill: **Trial #:**

___ 1. Did the teaching parent present at least two different pieces of the child's preferred edibles that the child chose first during the five preference assessments?

___2. Did the teaching parent ask the child to pick what edible he or she wanted to work for?

___3. Did the teaching parent put five pieces of the edible the child chose into a small container?

___4. Did the teaching parent bring the child into the bathroom?

___5. Did the teaching parent close the bathroom door?

___6. Did the teaching parent give the child the correct instruction (e.g., "Please wash your hands")?

___7. Did the teaching parent start teaching by implementing the appropriate level of prompt for ***all*** steps of the skill (e.g., last level of prompt used in the previous teaching session or trial)?

___8. Did the teaching parent provide appropriate consequence for ***each skill step*** (e.g., verbal praise ***each time*** the child correctly completed a skill step without problem behavior, with or without help from parent)?

___9. Did the teaching parent decrease the level of prompt one level when the child correctly completed ***each step*** of the skill (e.g., each skill step completed without problem behavior, with or without help from parent) three consecutive times?

___10. Did the teaching parent provide appropriate consequence after completion of ***all steps of a skill*** (e.g., verbal praise, physical touches, and one serving of the child-selected edible each time the child correctly completed each step without problem behavior, with or without help from parent)?

___ 11. Did the teaching parent return to the previous prompt level for the remaining skill steps if the child made an error (e.g., omitted a step, did not fully complete a step) or displayed problem behavior?

___12. Did the teaching parent remain calm and continue to prompt the child through the skill if the child attempted to pull away, protest, or resist the physical prompts?

___13. Did the teaching parent ask the child to complete the skill the correct number of times (e.g., five times if being taught, one time if mastered)?

Key: Y-Yes N-No NA-Not Applicable

Parent Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%
Child Bx: _____% Skill Steps with Pbx: _____%

Key:
Y-Yes
N-No
NA-Not Applicable

Appendix E- Teaching Parent Behavior Checklist for Implementing the Constant Time Delay Procedure

Teaching Parent Behavior Checklist Data Sheet

Date: **Primary Observer:**
Child Initial: **IOA Observer:**
Session Number:

Skill: **Trial #:**

___1. Did the teaching parent give the child the correct initial instruction (e.g., "Please wash your hands")?

___2. Did the teaching parent deliver a full physical prompt to help the child complete each skill step that the child did not complete within ***five s*** of the initial instruction or within ***five s*** of completing of the previous skill step?

___3. Did the teaching parent deliver a full physical prompt to help the child complete each skill step during which the child displayed problem behavior (e.g., throwing wash cloth, hitting parent, biting parent)?

___4. Did the teaching parent provide appropriate consequence for ***each skill step*** (e.g., verbal praise ***each time*** the child correctly completed a skill step without problem behavior, with or without help from parent)?

___5. Did the teaching parent provide appropriate consequence after completion of ***all steps of a skill*** (e.g., verbal praise, physical touches, and one serving of the child-selected edible if the child correctly completed each step without problem behavior, with or without help from parent)?

Key: Y-Yes N-No NA-Not Applicable

Parent Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%
Child Bx: _____% Skill Steps with Pbx: _____%

Appendix F-Operational Definitions of Problem Behavior

Operational Definitions of Laura's Problem Behavior (PBX)

- Hitting- open or closed hands or head making contact with any part of parent's body with enough force to produce a sound or a mark.
- Biting: anytime open mouth or teeth make contact with any part of parent's body and leaves a visible mark (e.g., red mark, bite marks).
- Throwing- grabbing and releasing object so that it travels more than 1 foot or makes an audible sound when it makes contact with another object.

Appendix G- Parent and Child Behavior Trial-By-Trial Data Sheet for Self-Care Skills

Closed Door? Y N

Correct Initial Instruction Given By Parent ("Please wash your hands") Y N

Skill Steps	WASH HANDS		Circle	Circle
1. Turn on water	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
2. Pump soap into hand 1x	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
3. Rub palms together	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
4. Rub top of 1 hand	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
5. Rub top of other hand	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
6. Rinse hands	Parent Behavior		Remained Calm and	Vocal praise if correct?

			Positive ? Y N	Y N N/A
	Child Behavior		PBX? Y N	
7. Turn off water	Parent Behavior		Remained Calm and Positive ? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
8. Dry hands with towel	Parent Behavior		Remained Calm and Positive ? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	

Edible Reinforcement Delivered Upon Completion of Skill? Y N
Vocal Praise Delivered Upon Completion of Skill? Y N
Physical Touches Delivered Upon Completion of Skill? Y N

Parent Percentage of Steps Competed Correctly: _____ / ____ = _____%

Child Percentage of Steps Competed Independently: _____/ 8 = _____%

Percentage of Steps Containing Problem Behavior: _____/ 8 = _____%

Notes:

Closed Door? Y N
Correct Initial Instruction Given By Parent ("Please wash your face") Y N

Skill Steps	WASH FACE		Circle	Circle
1. Get wash cloth	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
2. Turn on water	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
3. Wet wash cloth	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
4. Squeeze wash cloth	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
5. Pump soap into wash cloth 1x	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
6. Lift wash cloth to face	Parent Behavior		Remained Calm and Positive? Y	Vocal praise if correct? Y N N/A

			N	
	Child Behavior		PBX? Y N	
7. Rub wash cloth on face for at least 5 s	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
8. Rinse wash cloth with water	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
9. Lift wash cloth to face	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
10. Rub wash cloth on face for at least 5 s	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
11. Turn off water	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
12. Pat face with dry towel	Parent Behavior		Remained Calm and Positive	Vocal praise if correct? Y N

			? Y N	N/A
	Child Behavior		PBX? Y N	

Edible Reinforcement Delivered Upon Completion of Skill? Y N
Vocal Praise Delivered Upon Completion of Skill? Y N
Physical Touches Delivered Upon Completion of Skill? Y N

Parent Percentage of Steps Competed Correctly: _____ / ___ = _____%

Child Percentage of Steps Competed Independently: _____/ 12 = _____%

Percentage of Steps Containing Problem Behavior: _____/ 12 = _____%

Notes:

Closed Door? Y N
Correct Initial Instruction Given By Parent ("Please put on some lotion") Y N

Skill Steps	APPLY LOTION		Circle	Circle
1. Pick up lotion	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
2. Uncap lotion	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
3. Squeeze at least a dime-sized amount of lotion into hands	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
4. Rub palms together	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
5. Rub top of 1 hand	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
6. Rub top of the other hand	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A

	Child Behavior		PBX? Y N	
7. Rub face	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	
8. Cap lotion	Parent Behavior		Remained Calm and Positive? Y N	Vocal praise if correct? Y N N/A
	Child Behavior		PBX? Y N	

Edible Reinforcement Delivered Upon Completion of Skill? Y N
Vocal Praise Delivered Upon Completion of Skill? Y N
Physical Touches Delivered Upon Completion of Skill? Y N

Parent Percentage of Steps Competed Correctly: _____ / ___ = _____%

Child Percentage of Steps Competed Independently: _____/ 8 = _____%

Percentage of Steps Containing Problem Behavior: _____/ 8 = _____%

Notes:

Appendix H- Investigator Treatment Fidelity Checklist for the Graduated Guidance Parent Training Package: Graduated Guidance Teaching Overview

Trainer:_____ Date of Observation:_____

Scorer:_____

___ 1. Did the investigator give the teaching parent a written description of the graduated guidance teaching procedures?

___2. Did the investigator provide a general description of graduated guidance teaching?

___3. Did the investigator describe all of the skill steps from the task analysis?

___4. Did the investigator provide rationales?

___5. Did the investigator provide a detailed description of the steps involved in teaching the skill using graduated guidance?

___6. Did the investigator assess the teaching parent's knowledge of implementing graduated by asking aloud all of the oral quiz questions?

___7. Did the investigator continue to ask the teaching parent to answer any questions the teaching parent answered incorrectly until the parent answered all questions correctly?

Key:
Y-Yes
N-No
NA-Not Applicable

Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

IOA Observer:
Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

Appendix I- Investigator Treatment Fidelity Checklist for the Graduated Guidance Parent Training Package: Model and Role-Play with Immediate Feedback

Trainer:_____ Date of Observation:_____

Scorer:_____ Child Initials:_____ Session:_____

___ 1. Did the investigator first correctly demonstrate all steps of the graduated guidance teaching procedures with a research assistant playing the role of the child?

___2. Did the investigator demonstrate 8 steps of the graduated guidance teaching procedures correctly and 4 (steps 7, 8, 10, 11) incorrectly?

___3. Did the investigator ask the teaching parent to identify the steps that were implemented correctly and the steps that were implemented incorrectly?

___4. Did the investigator continue to demonstrate 8 steps of the graduated guidance teaching procedures correctly and 4 incorrectly (steps 7, 8, 10, 11) and ask the teaching parent to identify the steps that were implemented correctly and the steps that were implemented incorrectly until the teaching parent can correctly identify all correct and incorrect steps?

___5. Did the investigator have the teaching parent role-play his or her role and the non-teaching parent role-play the role of the child for the entire graduated guidance procedure?

___6. Did the investigator provide on-going feedback to the teaching parent (immediately following each parent behavior step) over the steps he or she performed correctly and steps she performed incorrectly?

___7. Did the investigator continue to have the teaching parent role-play her role and the non-teaching parent role-play the role of the child until the teaching parent role-played the entire graduated guidance procedure *and* performed her role with no within-session corrective feedback for five consecutive trials?

Key:
Y-Yes
N-No
NA-Not Applicable

Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

IOA Observer:
Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

Appendix J- Investigator Treatment Fidelity Checklist for the Graduated Guidance Parent Training Package: Immediate Feedback with Child

Trainer:_____ Date of Observation:_____

Scorer:_____ Child Initials:_____ Session:_____

___ 1. Did the investigator give behavior-specific praise to the teaching parent immediately following each skill step for all five skill trials?

___2. Did the investigator give corrective feedback to the teaching parent immediately following each skill step for all five skill trials?

Key:
Y-Yes
N-No
NA-Not Applicable

Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

IOA Observer:
Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

Appendix K- Investigator Treatment Fidelity Checklist for the Graduated Guidance Parent Training Package: Delayed Feedback with Child

Trainer:_____ Date of Observation:_____

Scorer:_____ Child Initials:_____ Session:_____

___ 1. Did the investigator give behavior-specific praise to the teaching parent at the end of each teaching session (i.e., after five skill trials)?

___2. Did the investigator give corrective feedback to the teaching parent at the end of each teaching session (i.e., after five skill trials)?

Key:
Y-Yes
N-No
NA-Not Applicable

Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

IOA Observer:
Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

Appendix L- Investigator Treatment Fidelity Checklist for the Constant Time Delay Parent Training Procedures: Oral Instructions

Trainer:_____ Date of Observation:_____

Scorer:_____

___1. Did the investigator give a detailed description of the steps involved in implementing the constant time delay procedure?

Key:
Y-Yes
N-No
NA-Not Applicable

Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

IOA Observer:
Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

Appendix M- Investigator Treatment Fidelity Checklist for the Constant Time Delay Parent Training Procedures: Immediate Feedback with Child

Trainer:_____ Date of Observation:_____

Scorer:_____ Child Initials:_____ Session:_____

___ 1. Did the investigator give behavior-specific praise to the teaching parent immediately following each parent behavior step?

___2. Did the investigator give corrective feedback to the teaching parent immediately following each parent behavior step?

Key:
Y-Yes
N-No
NA-Not Applicable

Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

IOA Observer:
Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

Appendix N- Investigator Treatment Fidelity Checklist for the Constant Time Delay Parent Training Procedures: Delayed Feedback with Child

Trainer:_____ Date of Observation:_____

Scorer:_____ Child Initials:_____ Session:_____

___ 1. Did the investigator give behavior-specific praise to the teaching parent at the end of the constant time delay trial?

___2. Did the investigator give corrective feedback to the teaching parent at the end of the constant time delay trial?

Key:
Y-Yes
N-No
NA-Not Applicable

Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

IOA Observer:
Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

Appendix O- Parent Intake Assessment Survey to Determine Child Teaching Targets

Parent Training Intake Survey

Name: _____
Date: _____

1) Please rate on a scale of "0-4" how *satisfied* (with "0" being "not at all satisfied" and "4" being "very satisfied") you are with your child's ability to demonstrate each of the following skills:

   AND

   Please rate on a scale of "0-4" how *important* (with "0" being "very unimportant" and "4" being "very important") it is for you or your child to learn or address each of these skills or areas:

- **Self-care skills**
  - **Washing**
    - Bathing body

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

    - Drying body

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

    - Washing face

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

    - Washing hands

Not at all satisfied	0	1	2	3	4	Very satisfied

Not at all important 0 1 2 3 4 Very important

- Flushing

Not at all satisfied 0 1 2 3 4 Very satisfied

Not at all important 0 1 2 3 4 Very important

- **Caring for body**
  - Combing/brushing hair

Not at all satisfied 0 1 2 3 4 Very satisfied

Not at all important 0 1 2 3 4 Very important

- Brushing teeth

Not at all satisfied 0 1 2 3 4 Very satisfied

Not at all important 0 1 2 3 4 Very important

- Applying Lotion

Not at all satisfied 0 1 2 3 4 Very satisfied

Not at all important 0 1 2 3 4 Very important

- **Dressing**
  - Dressing oneself

Not at all satisfied 0 1 2 3 4 Very satisfied

Not at all important 0 1 2 3 4 Very important

- Undressing oneself

Not at all satisfied 0 1 2 3 4 Very satisfied

Not at all important 0 1 2 3 4 Very important

- **Toileting**
  - Daytime urination

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

  - Nighttime urination

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

  - Bowel movements

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- **Feeding**
  - Using a spoon

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

  - Using a fork

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

  - Using a cup

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- Using a napkin

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- **Eating**
  - Amount of food being consumed

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

  - Eating a variety of foods

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- Other _____

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- **<u>Home living skills</u>**
  - **Putting things away (e.g., putting dirty clothes in hamper, putting tissues in the trash)**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- **Simple food preparation (e.g., microwave, toaster, spreading, stirring)**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- **Setting table**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- **Serving oneself**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- **Pouring liquids**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- **Cleaning up eating area/eating materials**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- **Make/change bed**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- **Care for pets**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- Other _____

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- **<u>Recreational skills</u>**
  - **Independently plays with toys**
    - Appropriately plays with toys

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

    - Amount of time spent playing with toys

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

  - **Plays with siblings**
    - Appropriately plays with siblings

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- Amount of time spent playing with siblings

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- Other _____

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- **Social skills**
  - **Appropriately interacts with familiar people**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

  - **Appropriately interacts with unfamiliar people**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

  - **Shares with others**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- Other _____

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- **Communication skills**
  - **Follows directions**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

  - **Expresses wants and needs**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

  - **Names objects**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

  - Other _____

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- **<u>Challenging behaviors</u>**
    - **Sleeping issues**
        - Going to bed

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

        - Falling asleep

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

        - Staying asleep

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

    - **Occurrence of tantrums**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

    - **Occurrence of physical aggression**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

    - **Occurrence of self-injury**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- **Occurrence of self-stimulatory behavior**

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- Other ______________________

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

2) Please list any other areas or skills you would like to work on during a parent training program. Please rate how *satisfied* you are *and* how *important* they are to you.

- Other ______________________

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- Other ______________________

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- Other ______________________

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- Other ____________________

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- Other ____________________

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

- Other ____________________

Not at all satisfied	0	1	2	3	4	Very satisfied
Not at all important	0	1	2	3	4	Very important

3) Feel free to write down any additional comments or questions!

Thank you for your time and input!

Appendix P- Detailed Written Instructions on How to Conduct a Preference Assessment

Instructions On How To Conduct A Preference Assessment

Before you begin teaching your child, you will need to identify several preferred edible items that can be used as rewards for your child during teaching. To identify these rewards, you will be learning how to conduct a preference assessment.

- Please make sure that your child does not consume any food within ***1 hour*** prior to conducting a preference assessment.

- Please implement the following steps when conducting a preference assessment* with your child:

1. Gather at least five different edible items that your child enjoys and make sure each item is smaller than the size of a quarter (feel free to cut or break each item to make each item that size).
2. Present the five edible items in a straight line and approximately two inches apart.
3. Ask your child to pick an item he or she wants by saying, “Pick one.”
4. Block any attempts to choose more than one item.
5. Remove the item your child chooses, allow him or her to consume the item, and DO NOT REPLACE the item.
6. Take the item at the left end of the line and move it to the right end.
7. Shift the remaining items so that they are evenly spaced approximately two inches apart.
8. Repeat steps 3-7 until all items have been selected or your child does not make a selection within 30 seconds of you asking them to do so.
9. If, at any time during the preference assessment, your child does not make a selection within 30 seconds, remove all items and end the assessment.

- Please conduct at least five preference assessments with your child across five different days using the ***same*** five edible items each time.

- Please fill out the attached data sheet each time you conduct a preference assessment.

- After you have completed the five preference assessments please choose all the edibles that your child selects ***first*** during preference assessments to be used as rewards during teaching sessions. (If your child selects the same item first during all five preference assessments, please also include any items he or she chose second.)
    - Make sure to store these edibles in an area that your child cannot reach.
    - Make sure that these edibles are ***only available*** to your child during teaching sessions.

*Adapted from Deleon, I. G. & Iwata, B. A. (1996). Evaluation of a multiple-stimulus presentation format for assessing reinforcer preferences. *Journal of Applied Behavior Analysis*, *29*, 519–533.

Preference Assessment Data Sheets

Preference Assessment 1

Date:_____

List of Edible Items Presented:

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

Order of Selection:

Item Chosen
First:_____

Item Chosen
Second:_____

Item Chosen
Third:_____

Item Chosen
Fourth:_____

Item Chosen
Fifth:_____

List of Any Items Not Selected During This Assessment:

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

Preference Assessment 2

Date:_____

List of Edible Items Presented:

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

Order of Selection:

Item Chosen
First:_____

Item Chosen
Second:_____

Item Chosen
Third:_____

Item Chosen
Fourth:_____

Item Chosen
Fifth:_____

List of Any Items Not Selected During This Assessment:

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

Preference Assessment 3

Date:_____

List of Edible Items Presented:

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

Order of Selection:

Item Chosen
First:_____

Item Chosen
Second:_____

Item Chosen
Third:_____

Item Chosen
Fourth:_____

Item Chosen
Fifth:_____

List of Any Items Not Selected During This Assessment:

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

Preference Assessment 4

Date:_____

List of Edible Items Presented:

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

Order of Selection:

Item Chosen
First:_____

Item Chosen
Second:_____

Item Chosen
Third:_____

Item Chosen
Fourth:_____

Item Chosen
Fifth:_____

List of Any Items Not Selected During This Assessment:

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

Preference Assessment 5

Date:_____

List of Edible Items Presented:

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

Order of Selection:

Item Chosen
First:_____

Item Chosen
Second:_____

Item Chosen
Third:_____

Item Chosen
Fourth:_____

Item Chosen
Fifth:_____

List of Any Items Not Selected During This Assessment:

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

Appendix Q- Investigator Treatment Fidelity Checklist for the Preference Assessment Parent Training Package: Preference Assessment Overview

Trainer:_____ Date of Observation:_____

Scorer:_____

___ 1. Did the investigator give the teaching parent a written description of the preference assessment procedures?

___2. Did the investigator give a general description of the preference assessment?

___3. Did the investigator provide rationales?

___4. Did the investigator give a detailed description of the steps involved in conducting a preference assessment?

___5. Did the investigator assess the teaching parent's knowledge of conducting preference assessments by asking aloud all of the oral quiz questions?

___6. Did the investigator continue to ask the teaching parent to answer any questions the parent answered incorrectly until the teaching parent answered all questions correctly?

Key:
Y-Yes
N-No
NA-Not Applicable

Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

IOA Observer:
Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

Appendix R- Investigator Treatment Fidelity Checklist for the Preference Assessment Parent Training Package: Model and Role-Play with Immediate Feedback

Trainer:_____ Date of Observation:_____

Scorer:_____

___ 1. Did the investigator first correctly demonstrate all steps of the preference assessment procedures with a research assistant playing the role of the child?

___2. Did the investigator correctly demonstrate five steps of the preference assessment and incorrectly demonstrate three steps?

___3. Did the investigator ask the teaching parent to identify the steps that were implemented incorrectly?

___4. Did the investigator continue to correctly demonstrate the same five steps of the preference assessment and incorrectly demonstrate the same three steps and ask the teaching parent to identify the steps that were implemented correctly and incorrectly until the teaching parent can correctly identify all correct and incorrect steps?

___5. Did the investigator have the teaching parent will role-play his or her role and the non-teaching parent role-play the role of the child?

___6. Did the investigator provide on-going feedback to the teaching parent (immediately following each parent behavior step) over the steps he or she performed correctly and steps he or she performed incorrectly?

___7. Did the investigator continue to have the teaching parent role play his or her role and the non-teaching parent role play the role of the child until the teaching parent successfully performs his or her role with no within-session corrective feedback three consecutive times (three preference assessments)?

Key:
Y-Yes
N-No
NA-Not Applicable

Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

IOA Observer:
Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

Appendix S- Investigator Treatment Fidelity Checklist for the Preference Assessment Parent Training Package: Role-Play with Delayed Feedback

Trainer:_____ Date of Observation:_____

Scorer:_____

___ 1. Did the investigator give behavior-specific praise to the teaching parent at the end of each preference assessment?

___2. Did the investigator give corrective feedback to the teaching parent at the end of each preference assessment?

___3. Did the investigator continue to have the teaching parent conduct preference assessments with the non-teaching parent with delayed feedback until the teaching parent is able to complete three consecutive preference assessments with no corrective feedback from the investigator?

Key:
Y-Yes
N-No
NA-Not Applicable

Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

IOA Observer:
Investigator Percentage of Steps Competed Correctly: _____ / ____ X 100 = _____%

Appendix T- Oral Quiz on Preference Assessment Procedures Given to Teaching Parents During Preference Assessment Overview

1. How many edible items should you gather before you conduct your first preference assessment?

   Answer: At least 5

2. Each edible item you present to your child during the preference assessment should be smaller than _____.

   Answer: A quarter

3. The items you present should be in a _____ and roughly 2 inches apart.

   Answer: Straight line

4. Next, ask the child to pick an item he or she wants by saying _____.

   Answer: "Pick one"

5. What should you do if your child attempts to choose more than 1 item?

   Answer: Block child from selecting more than 1 item

6. After your child selects an item, what should you do?

   Answer: Remove the item the child chooses and allow him or her to consume the item

7. Should you replace an item after your child consumes it?

   Answer: No, do not replace the item

8. After your child selects and consumes an item, what should you do with the remaining items?

   Answer: Take the item at the left end of the line and move it to the right end and shift the remaining items so that they are evenly spaced approximately two inches apart

9. You will continue to ask your child to select an item until _____. (i.e., When will you end the preference assessment?)

   Answer: When items have been selected or the child does not make a selection within 30 seconds of the parent asking them to do so

10. You will be conducting at least how many preference assessments?
    Answer: Five

11. Should you conduct more than one preference assessment on a given day?

    Answer: No, I will conduct five preference assessments with the child across five different days

12. Should you use the same edibles for each preference assessment?

    Answer: Yes

13. Where should the edibles used in the preference assessment be placed in your home outside of sessions?

    Answer: In an area that the child cannot reach

14. Should your child have access to the edibles used in the preference assessment outside of sessions?

    Answer: No

Appendix U- Detailed Written Instructions for Parents on How to Use Graduated Guidance to Teach a Skill

Parent Training Manual:

How To Successfully Teach Your Child

General Instructions

- To teach effectively, your child needs to view learning opportunities as positive experiences. To do this, you need to make sure that you do the following:
    1. Use an upbeat, positive, and enthusiastic voice tone and facial expression.
    2. Have an easy-going and relaxed attitude.
    3. Always remain calm, especially if your child gets upset.
    4. Do your best to ignore negative behaviors such as crying, screaming, hitting, kicking, and tantruming if they occur. For example, if your child begins to cry or protest, please do not reprimand or talk to your child about his or her negative behavior. Instead, simply carry on with your teaching.

Instructions On How To Teach Your Child A Skill

Now that you have found some edible rewards through the preference assessment, you can begin to teach your child a skill using ***graduated guidance***!

- To help your child learn, you will only be teaching ***one*** skill at a time until the skill is taught.

- **PLEASE READ ALL INSTRUCTIONS BEFORE YOU BEGIN TEACHING**

The first skill you will be teaching your child to complete by themselves is: **Washing Face**

Here are the ***skill steps*** you will teach your child to compete when washing their face:

- **Get wash cloth**
- **Turn on water**
- **Wet wash cloth**
- **Squeeze wash cloth**
- **Pump soap onto wash cloth one time**
- **Lift wash cloth to face**
- **Rub wash cloth on face for at least 5 seconds**
- **Rinse wash cloth with water**
- **Lift wash cloth to face**
- **Rub wash cloth on face for at least 5 seconds**
- **Turn off water**
- **Pat face with dry towel**

- Please implement the following steps when teaching your child a skill:

1. First, please place in front of your child at least two different pieces of your child's edible rewards that your child selected first during the preference assessments (please refer to the data sheets you completed when you conducted the five preference assessments). Then:
    a. Say to your child, "Pick what you want to work for."
    b. Remove the item your child chose and do not let your child consume it.
    c. Take five pieces of the edible item your child chose and place them in a small container.

2. Next, please take the container with the five edibles and lead your child into the bathroom and **close the door**.

3. Then, please tell your child to complete the skill (for example, "Please wash your face").

4. During each **teaching session**, you will instruct and help your child complete the **skill** ***five times***. Please re-state the instruction to complete the **skill** (e.g., "Please wash your face") each of the five times you ask your child to complete the skill.

5. Please end each teaching session after your child completes the skill ***five times***. Begin the next teaching session (e.g., next day) by implementing the same teaching phase you ended on in the previous teaching session (e.g., if you implemented teaching phase B during the fifth time you asked your child to complete a skill in session one, then you would begin teaching during teaching session two by implementing teaching phase B).

6. Please help your child complete the **skill** by implementing the following ***graduated guidance*** teaching phases:

Phase A. First, please tell your child to complete the skill (for example, "Please wash your face"). Next, place your hands on your child's hands and ***gently*** guide your child through each step of the **skill**.

- Each time your child correctly completes ***each step*** of the **skill**, please give them verbal praise (e.g., "Great job!," "Way to go!"). See attached *100+ Ways To Praise A Child* Copyright © 2005-2009 by Perkilou Products TM.
    - Correct completion of each ***step*** is when your child correctly performs each ***step*** either independently or with your help ***and*** does not display any negative behaviors (for example, hitting, biting, throwing) during the ***step***.
- Each time your child correctly completes ***all steps*** of the **skill** (all steps are completed independently or with your help ***and*** your child does not display any negative behaviors during the **skill**), please give them verbal praise, physical touches (e.g., tickles, hugs, back rubs), and one serving of the edible reward that your child selected.
- If your child gets upset or starts to engage in any negative behavior (e.g., crying, yelling, hitting, slapping, kicking) during teaching, please continue implementing Phase A, remain calm, and ignore the negative behavior as much as possible.
- Once your child has completed ***all steps*** of the **skill** correctly during Phase A ***three consecutive times during the same teaching session*** (that is, three times in a row during one teaching session), please move to Phase B.

Phase B. First, please tell your child to complete the skill (for example, "Please wash your face"). Next, place only your ***thumb and index fingers*** on your child's hands and ***gently*** guide your child through each step of the **skill**.

- Each time your child correctly completes ***each step*** of the **skill**, please give them verbal praise (e.g., "Great job!", "Way to go!"). See attached *100+ Ways To Praise A Child* Copyright © 2005-2009 by Perkilou Products TM.

- Correct completion of each ***step*** is when your child correctly performs each ***step*** either independently or with your help ***and*** does not display any negative behaviors (for example, hitting, biting, throwing) during the ***step***.

- Each time your child correctly completes ***all steps*** of the **skill** (all steps are completed independently or with your help ***and*** your child does not display any negative behaviors during the **skill**), please give them verbal praise, physical touches (e.g., tickles, hugs, back rubs), and one serving of the edible reward that your child selected.
- If at any time your child does not complete a skill ***step*** correctly or displays negative behaviors, immediately return to Phase A (guide your child using hand-over-hand prompts) for the remaining skill steps to complete the skill and then remain at Phase A until the child completes ***all*** steps of the **skill** ***correctly three consecutive times during the same teaching session*** (that is, three times in a row during one teaching session).
- Once your child has completed all steps of the **skill** correctly during Phase B ***three consecutive times during the same teaching session*** (that is, three times in a row during one teaching session), please move to Phase C.

Phase C. First, please tell your child to complete the skill (for example, "Please wash your face"). Then, "shadow" your child's hands by holding your hands within one inch of your child's hands and then guiding your child's hands (***without touching your child's hands***) to complete each step of the **skill**.

- Each time your child correctly completes ***each step*** of the **skill**, please give them verbal praise (e.g., "Great job!", "Way to go!"). See attached *100+ Ways To Praise A Child* Copyright © 2005-2009 by Perkilou Products TM.
    - Correct completion of each ***step*** is when your child correctly performs each ***step*** either independently or with your help ***and***

does not display any negative behaviors (for example, hitting, biting, throwing) during the step.

- Each time your child correctly completes ***all steps*** of the **skill** (all steps are completed independently or with your help ***and*** your child does not display any negative behaviors during the **skill**), please give them verbal praise, physical touches (e.g., tickles, hugs, back rubs), and one serving of the edible reward that your child selected.
- If at any time your child does not complete a skill ***step*** correctly or displays negative behaviors, immediately return to Phase B (guide your child using your thumb and index fingers) for the remaining skill steps to complete the skill and then remain at that phase until the child completes ***all steps*** of the **skill** ***correctly three consecutive times during the same teaching session*** (that is, three times in a row during one teaching session).
- Once your child has completed all steps of each **skill** correctly during Phase C ***three consecutive times during the same teaching session*** (that is, three times in a row during one teaching session), please move to Phase D.

Phase D. Finally, only give your child the initial verbal instruction to complete the **skill** (for example, "Please wash your face").

- Each time your child correctly completes ***each step*** of the **skill**, please give them verbal praise (e.g., "Great job!", "Way to go!"). See attached *100+ Ways To Praise A Child* Copyright © 2005-2009 by Perkilou Products TM.
    - Correct completion of each ***step*** is when your child correctly performs each ***step*** either independently or with your help ***and*** does not display any negative behaviors (for example, hitting, biting, throwing) during the ***step***.
- Each time your child correctly completes ***all steps*** of the **skill** (all steps are completed independently or with your help ***and*** your child does not

display any negative behaviors during the **skill**), please give them verbal praise, physical touches (e.g., tickles, hugs, back rubs), and one serving of the edible reward that your child selected.

- If at any time your child does not complete a skill ***step*** correctly or displays negative behaviors **or pauses for more than 5 seconds** (for example, you say "Please wash your face" and your child does not attempt to get the wash cloth within five seconds), immediately return to Phase C (guide your child by shadowing your child's hands) for the remaining skill steps to complete the skill and remain at that phase until the child completes ***all*** steps of the **skill *correctly three consecutive times during the same teaching session*** (that is, three times in a row during one teaching session).
- Once your child has completed all steps of each **skill** correctly during Phase D ***three consecutive times during the same teaching session*** (that is, three times in a row during one teaching session), you will begin teaching the next **skill**.

7. If your child asks for your help with completing a **skill** (e.g., "Mommy help," "Mommy do it," etc.), please continue to implement the appropriate teaching phase and tell your child, "You can do it."

8. Once again, during each **teaching session**, you will instruct and help your child complete the **skill *five times***. Please end each teaching session after your child completes the skill ***five times*** and begin the next teaching session (e.g., next day) by implementing the same teaching phase you ended on in the previous teaching session (e.g., if you implemented teaching phase B during the fifth time you asked your child to complete a skill in session one, then you would begin teaching during teaching session two by implementing teaching phase B).

9. Please remain in the bathroom with the door closed during and between all ***five times*** you ask your child to perform the **skill**.

10. After you have completed **Phase D**, each time you ask your child to perform the **skill** you only need to ask him or her to complete the skill ***one time*** (instead of five).

100+ Ways To Praise A Child

A+ work!
Amazing effort!
Awesome!
Beautiful work.
Beautiful!
Bingo!
Bravo!
Breathtaking!
Brilliant!
Class act!
Clever!
Congratulations!
Cool!
Dynamite!
Excellent!
Exceptional!
Exceptional performance.
Extra special work!
Fabulous!
Fantastic job!
Far out!
Fantastic work!
Give them a big hug.
Good!
Good for you!
Good job!
Good learning!
Good thinking!
Good planning!
Great!
Great answer!
Great discovery!
Great work!
Hip! Hip! Hooray!
Hooray for you!
How artistic!
How extraordinary!
How nice.
How original!
How smart!
How thoughtful of you!
I can't get over it!
I knew you could do it.
I knew you had it in you!
I like the way you did that!
I like you.
I trust you.
I'm proud of you.
It couldn't be better!
It's everything I hoped for!
Keep up the good work!
Looking good.
Magnificent!
Marvelous!
Neat!
Nice going!
Nice work!
Nothing can stop you now.
Now you've got it!
Outstanding!
Outstanding performance!
Phenomenal!
Remarkable job.
Right on!
Say, "thank you".
Spectacular work!
Stupendous!
Super!
Super job!
Super work!
Superb!
Take a bow!
Terrific!
Thanks for caring!
Thanks for helping!
That's amazing!
That's good manners.
That's incredible!
That's perfect.
That's remarkable.
That's right.
That's the best.
Thumbs up!
Unbelievable work!
Very brave!
Very good!
Way to go!
Well done!
What a genius!
What a great idea!
What a great listener!
What an imagination!
Wonderful!
Wonderful sharing.
Wow!
You belong.
You brighten my day.
You came through!
You deserve a hug
You did that very well.
You figured it out!
You go the extra mile!
You have a great sense of humor.
You have a wonderful smile.
You made it happen!
You made the difference!
You make me feel good.
You make me happy.
You make me smile!
You made my day.
You make my life complete.
You mean a lot to me.
You set a good example!
You should be proud!
You tried very hard!
You work hard.
Your effort really shows!
Your help counts!
Your project is first rate!
Your work is out of sight!
You're #1!
You're adorable.
You're amazing!
You're a champ!
You're a darling.
You're a good friend.
You're a good helper.
You're a good listener.
You're a joy!
You're a-ok!
You're a pleasure to know!
You're a real trooper!
You're a shining star!
You're a treasure.
You're a winner!
You're beautiful.
You're caring.
You're catching on!
You're exciting.
You're fantastic.
You're getting better!
You're growing up.
You're incredible.
You're inspiring!
You're neat!
You're on target.
You're on top of it.
You're on your way.
You're one-of-a-kind.
You're precious.
You're sensational!
You're sharp!
You're so creative.
You're so heavenly.
You're so important.
You're so kind!
You're so kissable.
You're so much fun.
You're so sweet.
You're special!
You're spectacular.
You're such a joy.
You're super!
You're the greatest!
You're tops!
You're unique!
You're very responsible!
You're very talented!
You're wonderful.
You've discovered the secret.
You've earned my respect!
You've got it!
You've got what it takes!
You've made progress!
You've outdone yourself!

A hug is worth 1,000 words!

Appendix V- Oral Quiz on Graduated Guidance Teaching Procedures Given to Teaching Parents During Graduated Guidance Overview

1. What should you do before you begin each teaching session?

   Answer: Lay out at least two different pieces of the child's edible reinforcers that they identified during the preference assessments (edibles the child selected first or second) and say to their child, "Pick what you want to work for."

2. After you child selects an edible they want to work for, how may pieces of the edible should you gather and bring into the bathroom with you?

   Answer: Five

3. When should you give your child the instruction to perform a skill?

   Answer: After I bring the child into the bathroom and close the door

4. Teaching on all skills will begin with you gently guiding your child through ***each step*** of the skill by providing what type of physical prompt?

   Answer: A hand-over-hand physical prompt

5. After the child has correctly performs ***each step*** of the skill (without displaying any problem behavior) with you implementing teaching Phase A (full hand-over-hand physical prompts) three consecutive times, what phase and level of physical prompt should you move to?

   Answer: Phase B in which I will implement a partial physical prompt in which I only use my thumb and index finger to gently guide the child through each step of the skill

6. How many consecutive times does the child need to successfully complete ***each step*** of the skill (without engaging in problem behavior) with you implementing Phase B (providing partial physical -thumb and index prompts) before you can move to Phase C (providing shadow prompts)?

   Answer: Three

7. What will a shadow prompt look like?

   Answer: I will "shadowing" the child's hands within approximately 1 inch for each step of the skill

8. What should you do if the child makes an error by either not successfully completing a step or engaging in problem behavior during a skill?

   Answer: I will return to the previous level of prompting and remain at that level until the child achieves the criterion of three consecutive correct trials

9. What will you do once the child correctly performs each step of the skill (without displaying any problem behavior) with you implementing shadow prompts three consecutive times?

   Answer: I will only present the initial instruction to compete the skill

10. What should you do each time your child correctly completes a ***step*** of a skill (i.e., step completed with or without help but ***without*** problem behavior)?

    Answer: I will provide verbal praise

11. What should you do each time your child incorrectly completes a ***step*** of a skill (e.g., step completed with problem behavior)?

    Answer: I will not provide verbal praise

12. What should you provide each time (i.e., trial) your child correctly completes ***ALL steps*** of a skill (i.e., each step completed with or without help but ***without*** problem behavior)??

    Answer: I will provide verbal praise, physical touches (e.g., back rubs, high fives, hugs), and one serving of the child-selected edible reinforcer

13. What will you do if your child attempts to pull away, protest, or resist the physical prompts?

    Answer: I will continue to physically prompt his or her child though the skill

14. What teaching phase and level of physical prompt will you begin using for each session?

    Answer: The teaching phase and level of physical prompt I ended on in the previous teaching session (e.g., if the teaching parent ended on prompt level two in session one, then teaching will begin on prompt level two in session two).

15. During each teaching session, how many times will you ask your child to complete the skill currently being taught?

    Answer: Five

Appendix W- Teaching Parent Behavior Checklist for Implementing Post-Training Probe Trials

Teaching Parent Behavior Checklist Data Sheet

Date: **Primary Observer:**
Child Initial: **IOA Observer:**
Session Number:

Skill: **Trial #:**

___1. Did the teaching parent give the child the correct initial instruction (e.g., "Please wash your hands")?

___2. Did the teaching parent refrain from providing verbal praise ***each time*** the child correctly completed a skill step without problem behavior)?

___3. Did the teaching parent end the probe trial in the child engaged in problem behavior ***or*** paused for more than ***five s*** before completing the skill?

___4. Did the teaching parent provide appropriate consequence after completion of ***all steps of a skill*** (e.g., verbal praise, physical touches, and one serving of the child-selected edible if the child correctly completed each step without problem behavior, only incorrectly or omitting no more than ***one skill step***)?

Key: Y-Yes N-No NA-Not Applicable

Parent Percentage of Steps Competed Correctly: _____ / _____ X 100 = _____%
Child Bx: _____% Skill Steps with Pbx: _____%

Appendix X- Social Validity Survey for Teaching Parents

Parent Training Social Validity Evaluation

1) How much did you like using the graduated guidance teaching procedures to teach your child?

Greatly disliked 0 1 2 3 4 Liked a great deal

2) How effective do you think the graduated guidance teaching procedures were in helping you teach your child?

Very ineffective 0 1 2 3 4 Very effective

3) How likely are you to continue using the graduated guidance teaching procedures to teach your child other skills?

Very unlikely 0 1 2 3 4 Very likely

4) How likely are you to recommend the graduated guidance teaching procedures to other parents?

Very unlikely 0 1 2 3 4 Very likely

5) How much did you like the remote parent training program (i.e., using iPads and FaceTime rather than engaging in in-home, face-to-face interactions)?

Greatly disliked 0 1 2 3 4 Liked a great deal

6) Overall, how helpful do you think the remote parent training procedures were in teaching you to teach your child effectively?

Very unhelpful 0 1 2 3 4 Very helpful

7) How helpful do you think the detailed written instructions were in teaching you to teach your child effectively?

Very unhelpful 0 1 2 3 4 Very helpful

8) How helpful do you think the graduated guidance overview/model/role play session was in teaching you to teach your child effectively?

Very unhelpful 0 1 2 3 4 Very helpful

9) How helpful do you think the BlueTooth coaching sessions were in teaching you to teach your child effectively?

Very unhelpful 0 1 2 3 4 Very helpful

10) How likely are you to recommend a remote parent training program to other parents?

Very unlikely 0 1 2 3 4 Very likely

11) Please rate on a scale of "0-4" how *satisfied* (with "0" being "not at all satisfied" and "4" being "very satisfied") you are with your child's ability to demonstrate each of the following skills:

- **Washing Face**

Not at all satisfied 0 1 2 3 4 Very satisfied

- **Washing Hands**

Not at all satisfied 0 1 2 3 4 Very satisfied

- **Applying Lotion**

Not at all satisfied 0 1 2 3 4 Very satisfied