Parent Training for Parents of Individuals Diagnosed with Autism Spectrum Disorder

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Introduction to Parent Training and ASD

Per the Center for Disease Control and Prevention (2012), it is now reported that 1 out of every 68 children living in the United States are diagnosed with autism spectrum disorder (ASD). The high prevalence has also been reported globally (Christensen, Baio, & Braun, 2012). For individuals diagnosed with ASD to make meaningful progress, they require early, intensive, and comprehensive intervention (Smith, Groen, & Wynn, 2000), with general consensus that interventions should be based upon the principles of applied behavior analysis (Smith & Iadarola, 2015). One recommended and empirically validated component of comprehensive intervention is parent training (National Autism Center, 2009, 2015).

There are many different varieties of parent training within the literature (Bearss, Burrell, Stewart, & Scahill, 2015) with a number of corresponding labels. "Parent support" often consists of several parents gathering together to discuss ideas, stories, experiences, and information about ASD and intervention, usually with the facilitation of professionals (Bearss et al., 2015a). "Parent education" is a form of parent training in which a professional provides didactic or manual instruction on concepts related to ASD and/or intervention (Bearss et al., 2015a). Parent training can also consist of counseling sessions, during which a therapist works with parents on issues related to stress, family functioning, and daily living. Another approach to parent training includes parent-mediated intervention, which consists of hands-on training during which parents are taught specific techniques that can be used to develop and improve their own child's skills (Kasari, Gulsrud, Paparella, Hellemann, & Berry, 2015). The goal of parent-mediated intervention is "… that parents may become co-facilitators in the intervention process" (Radley, Jeson, Clark, & O'Neill, 2014, p. 241). It is common for the aforementioned varieties of parent training to occur in isolation or as a combination with other formats. Although the term "parent training" can represent multiple forms, the primary focus of this chapter will be parent-mediated interventions, parent support groups, and parent education.

The purpose of this chapter is to (1) discuss the importance of parent training, (2) provide a historical perspective of parent training within the field of

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applied behavior analysis (ABA) as it relates to autism intervention, (3) provide a general overview of the research on parent training, and (4) discuss future research and clinical implications.

Benefits of Parent Training

There are many reasons why parent training should be included as part of a comprehensive intervention model. First, given the high prevalence of individuals receiving an ASD diagnosis, it may often be difficult for families to access the intensity of intervention required for best outcomes (Symon, 2005). Research has demonstrated that training parents to implement some or all of the intervention can help optimize the intensity of intervention (Wainer & Ingersoll, 2013a). Second, research has demonstrated that parent training can improve the quality of parent-child interactions (Koegel, Bimbela, & Schreibman, 1996), as well as improve upon desirable behaviors (e.g., language, imitation, and social behavior) and ameliorate less desirable behaviors (e.g., tantrums, self-injury, and stereotypy; Charlop & Trasowech, 1991; Moes & Frea, 2002). Third, when parents are trained to provide intervention, treatment effects can generalize and maintain over time (e.g., Koegel, Schreibman, Britten, Burke, O'Neill, 1982). Parent training may result in better generalization and maintenance as individuals diagnosed with ASD can receive more hours of intervention, through parent-mediated intervention, and in settings which may lead to longer-lasting changes. Fourth, research has demonstrated that parent training can reduce the stress and depression often reported by parents of children with a disability (e.g., Estes et al., 2009). Finally, research has shown that parents who are trained to provide intervention often demonstrate an increased optimism about their child's future, as well as more positive feelings about influencing their children's development (e.g., Koegel et al., 1982).

As this chapter will show, and other professionals and organizations have documented, parent training meets the criteria to be considered an evidence-based practice (National Autism Center, 2009, 2015). Therefore, given the many benefits parent training can have for the family and the individual diagnosed with ASD, training for parents and the family as a whole should be included as part of a comprehensive intervention program.

Seminal and Early Research on Parent Training

In one of the first empirical investigations of behavioral intervention for individuals diagnosed with ASD, Wolf, Risley, and Mees (1963) implemented operant conditioning procedures (e.g., extinction and shaping) to decrease the frequency of tantrums, improve bedtime behavior, and increase the duration of wearing glasses for a 3.5-year-old boy named Dickey. The results of this study demonstrated that operant conditioning procedures were responsible for improved behavior and provided the first empirical demonstration of ABA techniques as a treatment for an individual diagnosed with ASD. One component of this study was training for the mother and father on providing intervention for the target goal areas while at home. Although the specific details of the parent training were not described, the inclusion of parents within the study lends credence to the importance of parent training throughout the course of intervention for individuals diagnosed with ASD.

In 1973, Lovaas et al. were the first to evaluate a comprehensive behavioral intervention program for individuals diagnosed with ASD. The study consisted of 20 participants between 3 and 10 years old. All participants received intervention for 12–14 months in an inpatient setting. The intervention consisted of the implementation of behavior analytic principles (e.g., reinforcement, shaping, and punishment) to improve desired behaviors (e.g., appropriate speech, play, and social nonverbal behavior) and to eliminate undesired behaviors (i.e., self-stimulation and echolalia). Some of the participants' parents were trained (group 2), while others did not receive training (group 1). The researchers used standardized measures (i.e., Stanford Binet IQ Test and Vineland Social Maturity Scores) and various response measures to evaluate the effectiveness of

the intervention. Overall, the results indicated meaningful improvements for the participants. With respect to the effects of parent training, the authors stated "…follow-up measures recorded 1 to 4 years after treatment indicated that large differences between groups of children were related to the post-treatment environment (those groups whose parents were trained to carry out behavior therapy continued to improve; while children who were institutionalized regressed)" (Lovaas, Koegel, Simmons, & Long, 1973, p. 156). Thus, the results suggested the importance of including parent training as part of a comprehensive treatment model to ensure maintenance of skills acquired throughout the course of treatment.

The Lovaas et al. (1973) study was a catalyst for other seminal research in the behavioral treatment of ASD (e.g., Lovaas, 1987). Lovaas (1987) evaluated the effects of intensive, comprehensive behavioral treatment compared to a non-intensive, eclectic approach. Thirty-eight children were quasi-randomly assigned into 2 groups, 19 in the intensive group and 19 children in the control group. Within the study, Lovaas (1987) stated, "The parents worked as part of the treatment team throughout the intervention; they were extensively trained in the treatment procedures so that treatment could take place for almost all of the subjects' waking hours, 365 days a year." (p. 5). Those involved in the study have stated that parents became experts in ABA and ASD and in some cases were the best behavior analyst(s) on the child's team (Leaf, McEachin, & Taubman, 2008). The results of the study not only showed the need for intensive and comprehensive intervention but also illustrated the benefits of including parent training in an intensive, comprehensive model.

These seminal studies and other early investigations on ABA-based treatment for individuals diagnosed with ASD, as well as the work of other professionals/researchers evaluating the effects of parent training for parents of children with or without ASD (e.g., Baker, Heifetz, & Murphy, 1980; Forehand, Middlebrook, Rogers, & Steffe, 1983; Harris, Wolchik, & Weitz, 1981; Patterson & Fleischman, 1979), have served as a springboard for a plethora of research studies evaluating the effects of parent training, using a variety of methods for a variety of skills for their children diagnosed with ASD.

Parent Demographics

The plethora of research on parent training has resulted in many parent participants with varying demographics. Researcher typically provides varying degrees of information on these demographics when discussing their participants. Age is one demographic frequently noted. Within the parent training literature, there is a wide age range of the parent participants, with the youngest parent noted at 21 years old (Anan, Warner, McGillivary, Chong, & Hines, 2008) and the oldest at 52 years old (Poslawsky et al., 2015). Gender is another commonly noted demographic within the literature. The majority of studies on parent training have reported training only mothers (Koegel, Glahn, & Nieminen, 1978; Park, Alver-Morgran, Canella-Malone, 2011; Reagon & Higbee, 2009); however, there have been a few studies in which both mothers and fathers are included (e.g., Estes et al., 2014; Rocha, Schreibman, & Stahmer, 2007; Vismara et al., 2013). Some less commonly reported, and often not reported, demographics within the parent training literature are socioeconomic status (SES), education, nationality, and culture.

Training Methods

Several methods have been utilized for training parents. Some common methods include, but are not limited to, (1) demonstration and role-play (e.g., behavioral skills training or the teaching interaction procedure; Ingersoll & Wainer, 2013a; Rocha et al. 2007), (2) video modeling (e.g., Harris et al. 1981), (3) didactic instruction (e.g., Farmer & Reupert, 2013), and (4) active coaching (Kasari et al., 2015). What follows is a general overview of these methods with illustrated examples of each. However, each of these techniques has additional benefits and limitations, and clinicians should examine the literature on each when selecting a method for parent training.

Demonstration and Role-Play

One common method used to train parents occurs when the trainer demonstrates the targeted behavior and the parent participates in role-plays. Demonstration and role-play commonly take two different forms within the literature: (1) behavioral skills training (BST) that involves the trainer describing and demonstrating the skill, providing opportunities for the learner to practice the skill, and the trainer providing feedback (e.g., Seiverling, Williams, Sturmey, & Hart, 2012) and (2) the teaching interaction procedure (TIP) in which the teacher describes the skill, discusses rationales for why the skill is important, demonstrates the skill, role-plays the skill, and provides feedback (e.g., Rocha et al., 2007).

There are numerous benefits for the use of demonstration and role-playing during the course of training. For one, demonstrations provide an opportunity for the trainer to model examples and non-examples of the targeted skill. As such, modeling sets the occasion for observational learning of the targeted skill(s). Second, role-plays can lead to increased opportunities to provide positive reinforcement for approximations in a non-threatening, structured environment, therefore potentially decreasing stress and increasing the parent's confidence to display the skill in the criterion context. This method also allows the trainer to train loosely and program common stimuli and for training to align closely with the natural contingencies, all of which are important in promoting generalization across environments (Stokes & Baer, 1977). Finally, the inclusion of rationales (a component of TIPs) may lead to better understanding of the importance of the skill and may result in longer maintenance of the skill in the absence of the trainer and in the natural environment. That is, rationales can put the skill into context for the trainee (e.g., it is important to have the environment appropriately arranged before working on a skill, such as requesting, to allow for many prepared learning opportunities to be captured efficiently) which may lead to more generalized skills that maintain for longer periods of time.

Ingersoll and Wainer (2013b) provide an example of the use of BST during parent training. Within this study, the researchers demonstrated the effectiveness of BST in a group and a one-to-one instructional format to teach parents how to implement components of Project Impact. Project Impact is a teaching procedure that uses a combination of naturalistic behavioral intervention with a developmental approach to teach students various social behaviors and to improve language development. In this study, parents attended six group training sessions and six individual training sessions. The researchers evaluated improvement via formal standardized assessments for the children (e.g., Social Responsiveness Scale) as well as treatment fidelity evaluations. The results showed that parents improved their delivery of the intervention components and that the children showed improvements on the targeted skills.

TIPs have also been demonstrated as a successful method to train parents in the implementation of various behavior analytic techniques. For example, Rocha et al. (2007) implemented a TIP to teach three parents how to implement Pivotal Response Training (PRT) and Discrete Trial Teaching (DTT) to increase joint attention for his or her child. Parents were taught various procedures associated with DTT (e.g., providing an appropriate instruction, providing feedback, and completing the trial) and PRT (e.g., using choice, motivation, and following his/her child's lead). Training consisted of the researcher providing information about the procedures and rationales, (e.g., why joint attention is important) followed by a teacher modeling the behavior, the parent implementing the procedure, and receiving feedback on their implementation. Results of the study showed that parents increased the amount of joint attention bids provided, and children demonstrated improvement in joint attention.

Video Modeling

Another common training method explored within the parent training literature is video modeling (e.g., Berquist & Charlop, 2014). Video modeling has many benefits as a training tool. For one, similar to role-playing, video modeling provides examples and non-examples of the targeted skill.

Also, when video models contain multiple exemplars, they increase the likelihood of generalization of the skill (Stokes & Baer, 1977). Unlike role-plays, video modeling provides parents with a permanent product that they can reference in the absence of the trainer. Video modeling is commonly included as a component of other training methods.

Harris et al. (1981) taught 11 parents how to implement a variety of behavior analytic techniques (e.g., shaping, data collection, chaining, and prompting) focusing on the language development of their children. The intervention was conducted within a group instructional format and consisted of BST with the addition of video models. Although the authors of the study stated that videos were included, no description was provided as to what was specifically shown on the videos. At the conclusion of the study, improvements were observed in the children's language skills.

More recently, Berquist and Charlop (2014) taught six parents how to evaluate an intervention that consisted of multiple components, including video modeling. Training consisted of a combination of a manual and training sessions using BST. A video was used in conjunction with the manual and contained a variety of information for evaluating interventions (e.g., operationally defining targeted behavior, how data collection can be determined to be effective, and identifying the claim of the intervention). Parents were taught how to evaluate a treatment across 14 different dimensions (e.g., graphed results, identifying question of interest, and identifying target behavior). The results of a multiple baseline design showed an increase in the parents displaying the dimensions of evaluative behaviors.

Didactic Instruction

Didactic instruction, as applied to parent training, provides parents with information on how to implement various procedures and increase their general understanding of those procedures. Although didactic instruction can be implemented in isolation, it is commonly implemented with other procedures within the parent training literature (e.g., Farmer & Reupert, 2013).

Didactic instruction offers several benefits for parents and trainers. It can provide parents foundational information which may lead to a better understanding of the importance of the various procedures that they are taught. When didactic instruction is provided in a group instructional format, it provides parents the opportunity to learn from each other, develop support networks, and solve problem with other parents. With respect to the trainer, didactic instruction allows for training large numbers of parents, which may result in more efficient training.

Farmer and Reupert (2013) provide an example of a study that used didactic instruction as part of a parent training intervention. The researchers conducted a 6-week parent education program for 86 parents living in rural Australia. The program was implemented in a group instructional format with each group lasting 6 h. Each week's session covered a new topic (e.g., what is autism, social understanding, and sensory processing). At the conclusion of the 6 weeks, parents self-reported (i.e., parents filled out a Likert scale across 15 different questions) an increase in knowledge of the various topics.

Active Coaching

Another form of parent training is known as active coaching. Active coaching consists of the trainer providing in vivo feedback, while the trainee attempts to demonstrate the targeted skill. Typically, active coaching is implemented simultaneously with other procedures, such as didactic instruction (e.g., Kasari et al., 2015) and/or modeling (e.g., Radley et al., 2014).

Active coaching has many benefits as a method to train parents. For instance, active coaching sets the occasion for trainers to provide immediate feedback. Immediate feedback may be more desired than delayed feedback when targeting new skills (Cooper, Heron, & Heward, 2007) to prevent incorrect implementation of the intervention for an extended period of time. Also, active coaching is conducive to training in the

environment in which the skill is to occur as opposed to an analogue setting. Targeting a skill in the environment in which it is to be used increases the likelihood of the behavior coming under control of the naturally occuring stimulus conditions (Stokes & Baer, 1977).

In an example of active coaching, Kasari, Gulsrud, Paparella, Hellemann, and Berry (2015) compared the JASPER parent-mediated model to a psychoeducational intervention (PEI) for 86 parents. The parents were randomly assigned to the PEI or JASPER condition. The JASPER model consisted of 10 h of active coaching targeting joint engagement through a combination of developmental and behavioral procedures. Parents were taught to recognize their child's developmental level of play, how to jointly engage in an activity, and how to keep their child engaged. The PEI model consisted of 10 h of didactic instruction during which parents were taught about autism, improving social behavior, and managing parental stress. The primary measure was joint engagement between the parent and child. Additional measures included child play skills, standardized assessments of the child's skill level (e.g., Reynell receptive language test), and measures of parental stress (e.g., Parental Stress Index). The results of the study indicated that parents assigned to the JASPER model showed higher levels of joint engagement, but there were mixed results on the other child-specific measures. Although in regard to stress measures, the parents in the PEI condition showed lower levels post-intervention when compared to parents in the JASPER condition.

Although there are many benefits to active coaching, there are some disadvantages found within the literature. First of all, in many studies, the procedures associated with active coaching are not thoroughly described which may make it difficult to replicate. Second, active coaching may be labor intensive as it requires one-on-one intervention with the parent and child and, therefore, less efficient than other methods of parent training. Third, since it is usually combined with other training procedures, it is often difficult to determine if active coaching itself or another component of the training package is responsible for the behavior change.

Instructional Formats

The aforementioned training methods are commonly implemented in three different instructional formats. The first, and most common, instructional format within the literature is a one-to-one instructional format. One-to-one instructional formats provide the opportunity for the trainer to work directly with the parents on an individual basis. Researchers have demonstrated the effectiveness of a one-to-one format for training parents using a variety of training methods, including video modeling (e.g., Berquist & Charlop, 2014) and demonstration and role-play (e.g., Rocha et al., 2007).

A second instructional format in which various training techniques can be implemented is group instruction. Group instruction consists of two or more parents participating in the intervention simultaneously. Group instruction sets the occasion for observational learning which may result in more efficient training targeted (e.g., Leaf et al., 2013) as parents can acquire skills not directly. Group instruction has been used within the literature with video modeling (e.g., Harris et al., 1981), demonstration and role-play (e.g., Laugeson, Frankel, Mogil, & Dillon, 2009), and didactic instruction (e.g., Farmer & Reupert, 2013). The PEERS model of social skills groups (for a detailed description of the PEERS Model see, Laugeson et al., 2009; Yoo et al., 2014) is a prime example of parent training that occurs in a group instructional format. For example, Laugeson et al. (2009) utilized BST within a group instructional format to teach 33 parents to improve their child's friendships with peers. After 12 sessions of intervention, parents more effectively facilitated relationships using the procedures taught.

Group instruction and one-to-one instruction can also occur in combination (e.g., Anan et al., 2008). For example, Harris, Wolchik, and Milch (1983) conducted and evaluated the effects of training 11 parents of children diagnosed with ASD. The authors targeted a variety of skills (e.g., data collection, shaping, promoting generalization) using BST. The researchers conducted training in a group instructional format and

conducted home visits to provide one-to-one training. The researchers measured the parents' speech-oriented language toward their respective child and found an improvement following intervention.

An increasingly common instructional format for parent training is telehealth (e.g., Suess et al., 2014; Vismara et al., 2013), which involves the use of telecommunication technologies (e.g., video conferencing) to provide training to parents remotely. This format is often used due to large geographical distances between the family and the trainer (Vismara et al., 2013). Telehealth has advantages over more traditional instructional formats (i.e., in person). For instance, telehealth can be used to provide training for parents who otherwise would not be able to access training due to distance or limited services. Additionally, depending on the nature of the training, telehealth can be accessed at the parents' leisure, minimizing scheduling conflicts. Telehealth is also amenable to training occurring in multiple environments, which can be individualized and selected based on parent responding. For example, a more structured environment can be selected when necessary and systematically transferred to the natural environment.

In an example of the use of parent training via telehealth, Vismara et al. (2013) trained eight parents in the principles of the Early Start Denver Model (ESDM; for detailed description of ESDM, see Estes et al., 2014; Vismara et al., 2009; Vismara, McCormick, Young, Nadhan, & Monlux, 2013). The intervention occurred across 12 sessions, each lasting 1.5 h, within a one-to-one instructional format. The sessions consisted of the parent discussing the child behaviors that had occurred in the last week, followed by a 10 min observation of the child and parent interacting, and then discussing the skill topics from previous sessions, new skill topics, and how to implement these in generalized environments. The main dependent variables for the parents were parent-child interaction, parent satisfaction, and fidelity of treatment. After treatment had concluded, the parents implemented the procedures with higher levels of treatment fidelity and higher levels of engagement and reported that they had a better understanding and appreciation of how to help their child.

Although there are advantages to telehealth, there are some disadvantages as well. For one, the trainer can only observe what is occurring on the screen, which makes it difficult to assess what other events may be influencing the parent's behavior. Second, telehealth does not allow the trainer to model the correct behavior/procedure directly with the individual diagnosed with ASD. Finally, telehealth has to be implemented with extreme caution to protect the client's rights and to avoid HIPPA violations.

Parent Targets

Within the literature on parent training, parents have been trained to implement a variety of teaching procedures. Some of these procedures have included, but are not limited to, DTT (e.g., Neef, 1995), PRT (e.g., Buckley, Ente, & Ruef, 2014), ESDM (e.g., Vismara, Colombi, & Rogers, 2009), the Picture Exchange Communication System (PECS; e.g., Park, Alber-Morgan, & Cannella-Malone, 2011), and Functional Communication Training (FCT; e.g., Suess et al., 2014).

Discrete Trial Teaching DTT is a commonly implemented procedure during the course of treatment for many individuals diagnosed with ASD. DTT consists of three primary components: the teacher delivering an instruction, a response made from the learner, and a teacher-delivered consequence (Lovaas, 1987). Lovaas et al. (1973) and Lovaas (1987) included parent training on the implementation of DTT. Since these publications, there have been numerous studies which have also involved the training of parents on the implementation of DTT (e.g., Crockett, Fleming, Doepke, & Stevens, 2007; Koegel et al., 1978; Lafaskis & Sturmey, 2007; Rocha et al., 2007; Schreibman, Kaneko, & Koegel, 1991).

For example, Neef (1995) investigated the use of a pyramidal training approach (i.e., trainees becoming trainers) compared to professional-led training with 26 parents (20 mothers, 6 fathers).

Training involved how to select and arrange stimuli, provide instructions and prompts, deliver contingent consequences, record data, and structure the teaching session (all of which are components of DTT). The pyramidal approach involved training five parents, referred to as Tier 1 parents, until mastery. Those parents then conducted the training for additional parents, referred to as Tier 2 parents, and were matched based on demographics and child skill level. The Tier 2 parents then provided the training for the next group of parents, and this pattern was continued until all of the parents were trained, thus the term "pyramidal training." All parents in the professional-led training group were trained exclusively by professionals rather than previously trained parents. The percentage of steps demonstrated correctly across both groups improved from baseline to intervention; however, parents who received the pyramidal training performed better on generalization probes.

Pivotal Response Training PRT is a naturalistic treatment intervention that focuses on teaching pivotal behaviors for children diagnosed with autism spectrum disorder. These behaviors are considered to be pivotal as they lead to widespread behavioral gains. PRT focuses on increasing motivation, responsivity to multiple cues, self-management, and social initiations. Several studies have explored training parents in the PRT model. For example, Buckley, Ente, and Ruef (2014) provided training to a parent of a child with an ASD at the family's home, which consisted of providing instructional materials on PRT, video models, reviewing videos of the parent implementing the intervention, and role-playing. Targeted skills included, but were not limited to, letting the child select the activities/materials, interspersing mastered and acquisition tasks, and providing choices (Buckley et al., 2014). Data was collected on the child's rate of compliance and the parent's target skills, and both showed an increase in the rate of correct responding following training. Measures of improved quality of life (i.e., interviews following the intervention) also indicated that the parent enjoyed the training and felt the quality of life improved for herself and her child.

Early Start Denver Model ESDM is a comprehensive treatment approach for children under 4 years of age (Estes et al., 2014; Vismara et al., 2009, 2013). ESDM incorporates a developmental and naturalistic behavioral approach and includes parent involvement as a core concept within the treatment process.

In an example of training parents in the ESDM, Vismara et al. (2009) evaluated the effects of parent training with eight parents who received 12 weeks of training with each training session lasting 1 h. Vismara and colleagues utilized BST and provided parents with a manual on ESDM principles to teach parents to implement 14 different components of ESDM. Additionally, the researchers evaluated child progress across numerous behaviors (e.g., verbal utterances, imitative behaviors, and attentiveness). The training resulted in improved implementation of ESDM components by the parent participants, which also corresponded with improvement across the child measures.

Picture Exchange Communication System It has been reported that approximately 25% of children diagnosed with ASD will not develop functional vocal language (Tager-Flusberg, Paul, & Lord, 2005). To help children communicate, the use of augmentative and alternative communication systems, such as the PECS (Bondy & Frost, 1994), is sometimes required. PECS is a systematic teaching approach that uses pictures to help children communicate. Researchers have demonstrated the effectiveness of PECS to improve communication skills (e.g., Park, Alber-Morgran, & Cannella-Malone, 2011) and increase spontaneous speech (e.g., Anderson, Moore, & Bournce, 2007) with individuals diagnosed with ASD. However, there have been relatively few studies that have evaluated parents' roles in PECS implementation (Ben Chaabane Alber-Morgan, & DeBar, 2009; Park et al., 2011).

Park et al. (2011) provided an example of one of the few studies that included parents within the PECS implementation. Park and colleagues trained three mothers of 2-year-old children with an ASD to implement Phase 1, Phase 2, Phase 3A, and Phase 3B of PECS (for detailed description of the Phases of PECS see; Bondy & Frost, 1994).

Training was conducted utilizing BST. The results showed an increase in the percentage of independent picture exchanges and a high level of treatment integrity across each of the three mothers.

Functional Communication Training When attempting to ameliorate aberrant behavior, it is important to find a socially appropriate, functional alternative behavior. One procedure which has demonstrated effectiveness in teaching such behaviors is FCT (Carr & Durand, 1985). FCT has been used to teach responses that produce the same consequence that the less desirable behavior would have produced (e.g., requesting a break to escape a task as opposed to engaging in physical aggression). FCT is a commonly implemented technique to address aberrant behavior (Tiger, Hanley, & Bruzek, 2008), and researchers have demonstrated that parents can be trained in its implementation (Wacker et al., 2005, 2013).

Suess et al. (2014) provided an example of training parents to implement FCT via telehealth. The training involved didactic instruction and coaching for three parents to conduct FCT with their respective child following a functional behavior assessment (FBA). The FBA was conducted to determine the likely function of the aberrant behavior so an appropriate replacement behavior could be selected. The researchers measured the percentage of steps completed correctly by the parents from a dyad-specific task analysis. Suess and colleagues' results indicated an increase in the percentage of correct steps completed by the parents and a corresponding decrease in the children's aberrant behavior.

Multiple Component Quality behavioral intervention requires a therapist to not only implement one procedure but a variety of procedures and to implement these procedures accurately (Leaf et al., 2016). Thus, a therapist should be fluent in the implementation of procedures such as DTT, shaping, behavior reduction programs, social skills interventions, etc. (Leaf et al., 2016). Given the amount of time parents spend with their children, some of which may involve providing intervention, it is equally important for parents to be fluent in a number of behavior change techniques. As such, there have been several studies that have explored training parents on a variety of procedures (e.g., Cordisco, Strain, & Depew, 1988; Harris et al., 1983; Heitzman-Powell, Buzhardt, Rusinko, Miller, 2014; Koegel et al., 1978; Sallows & Graupner, 2005).

Lerman, Swiezy, Perkins-Parks, and Roane (2000) provide an example of training three parents on a variety of behavior change techniques based upon the principles of ABA. The behavior change techniques included the use of differential reinforcement, instructional and communication prompts, as well as how to respond to inappropriate behavior, increase compliance, and provide instructions. Training consisted of written instructions outlining various concepts and techniques, as well as in situ feedback. The results of a multiple baseline design showed that the parents implemented the techniques with greater accuracy following intervention and child measures indicated the techniques were effective.

Child Targets

Many of the studies evaluating parent training involve measures of child behavior as the primary dependent variable. These measures provide an opportunity to determine if the technique(s) on which the parents are trained were effective for their children. Many of the child skills targeted within the parent training literature fall within the core deficit areas of the ASD diagnosis, but there are additional skills outside of the core deficits that are frequently targeted as well.

Language One of the diagnostic criteria for individuals diagnosed with ASD is an impairment in language, which can range from mild (e.g., difficulties with complex social language) to severe (e.g., having no appropriate vocal language; American Psychiatric Association, 2013). Behavioral interventions frequently address language skills for individuals diagnosed with ASD. Therefore, it is not surprising that many parent training programs have focused on training parents to implement techniques to improve language. As such, child measures within the parent training research have shown that, following

training, parents were effective in increasing sound production (e.g., Harris et al., 1983), word production (e.g., Harris et al., 1983), requesting (e.g., Suess et al., 2014), spontaneous language (e.g., Charlop & Trasowech 1991; Ingersoll & Wainer, 2013a), social exchanges (e.g., Park et al., 2011), and social communication (e.g., Ingersoll & Wainer, 2013b; Reagon & Higbee, 2009; Vismara et al., 2009). For instance, Charlop and Trasowech (1991) evaluated parent training focused on language development for three parents of children diagnosed with ASD using BST. Parents were taught to implement a progressive time delay prompt (i.e., gradually increasing the amount of time before a prompt is provided) to help increase spontaneous speech from their respective child. Using a multiple baseline design, the results showed that there was an increase in the children's spontaneous speech and generalization to other people and locations following parent training.

Social Skills Another core deficit for individuals diagnosed with ASD is a qualitative impairment in social behavior (American Psychiatric Association, 2013). As such, comprehensive, quality intervention should address deficits in social behavior (Leaf et al., 2016). Much of the research involving parents has focused on training techniques to increase specific social behaviors and/or to facilitate pro-social relationships (Crockett et al., 2007; Kashinath, Woods, & Goldstein, 2006; Laugeson et al., 2009; Radley, Jenson, Clark, & O'Neill, 2014; Yoo et al., 2014). One example of parent training targeting social behavior was a study conducted by Kashinath et al. (2006) in which the researchers used BST to teach five parents how to implement a variety of behavioral procedures (e.g., cuing, time delay, and modeling). One of the targeted skills was improving the child's indoor play, and the results showed that parent training led to improvements with this skill. Laugeson et al. (2009) provide another example in which parents were trained how to help facilitate and foster relationships (e.g., friendships) within the PEERS model. After training occurred, participants who were included in the PEERS model demonstrated an improvement in their social behavior and interactions with peers.

Reduction of Aberrant Behavior Individuals diagnosed with ASD can display a variety of aberrant behaviors (e.g., stereotypic behavior, self-injury, aggression, sleeping challenges, etc.), all of which can interfere with learning and decrease their overall quality of life (Bearss et al., 2015). As such, there are many techniques that can decrease the frequency, intensity, and duration of aberrant behavior. Decreasing the likelihood of aberrant behavior can also decrease stress and anxiety for parents and the rest of the family (Durand, Hieneman, Clarke, Wang, & Rinaldi, 2013). Therefore, research on parent training has explored training parents in techniques to ameliorate these challenges. Within the parent training literature, child measures have helped show that parents who successfully implemented techniques on which they were trained resulted in a decrease in aggression displayed by their child (e.g., Lerman et al., 2000; Powers, Singer, Stevens, 1992), as well as decreases in whining (Powers et al., 1992), noncompliance (Lerman et al., 2000; Powers et al., 1992), stereotypy (e.g., Bearss et al., 2015), irritability (e.g., Bearss et al., 2015), self-injury (e.g., Learman et al., 2000), sleeping issues (e.g., Malow et al., 2014), and mealtime challenges (e.g., Najdowski et al., 2010; Seiverling et al., 2012; Sharp, Bureel, & Jaquess, 2014).

In an example of parent training to decrease aberrant behavior, Bearss and colleagues (2015) conducted a comparison investigation consisting of randomly placing 91 parents in a parent training program and 89 parents in a parent education program across six different centers in the United States. The parent training program consisted of BST, while the parent education program consisted of providing parents with didactic information. Using the Aberrant Behavior Checklist as their main measure, both treatments led to a decrease in aberrant behavior, but the results showed that parent training was superior to parent education for reducing aberrant behavior according to the parents across both groups.

Other Skills Parent training research has also examined child behaviors that do not fall within the core deficit categories of ASD. Additional parent training interventions have resulted in

improvements of child skills within the areas of self-help skills (e.g., Cordisico et al., 1988), joint attention (e.g., Kasari et al., 2015, Rocha et al., 2007), receptive instructions (e.g., Lafasakis & Sturmey, 2007), discrimination (e.g., Koegel et al., 1978), and cognitive development (e.g., Anan et al., 2008). Researchers have also used parent training to help parents improve their stress levels (e.g., Al-Khalaf, Dempsey, & Dally, 2014; Ali Samadi & Mahmoodizadeh, 2014), increase their self-efficacy (e.g., Poslawsky et al., 2015), increase general knowledge of autism (e.g., Farmer & Reupert, 2013), and increase their ability to record behavior (e.g., Herbert & Baer, 1972).

Types of Measurement

Researchers have used a variety of measures to evaluate the effects of parent training. Numerous studies have used direct measures (i.e., objective data) of the behavior of the parents (e.g., implementing FCT, implementing shaping, implementing DTT) who participated (e.g., Berquist & Charlop, 2014; Corsidico et al., 1988; Crockett, Fleming, Doepke, Stevens, 2007; Harris et al., 1981, 1983; Herbet & Baer, 1972; Lafasakis & Sturmey, 2007). Other studies have used subjective, rather than objective, measures to demonstrate improvements in parent behavior (e.g., Cordisco et al. 1988; Farmer & Reupert, 2013; Heitzman-Powell et al., 2014). There have also been several studies that have used formal and/or standardized assessments to measure progress (Anan et al., 2008; Bearss et al., 2015b; Estes et al., 2014).

While parent behavior is generally the primary focus of parent training, the desired outcome of training parents is to produce positive behavior change with their children. Therefore, measures of the child's behavior change are commonly taken and, in some cases, are the primary dependent variables (e.g., Charlop & Trasowech, 1991; Cordisco et al., 1988; Harris et al., 1983; Herbert & Baer, 1972; Ingersoll & Wainer, 2013). There also have been several studies that have combined various measures (e.g., Cordisco et al., 1988; Harris et al., 1983; Herbert & Baer, 1972; Ingersoll & Wainer, 2013a).

Future Directions

The research on parent training is robust. Researchers have shown that parent training can be effective in changing the behavior of parents of individuals diagnosed with an ASD using multiple methods (e.g., behavioral skills training, coaching, video modeling, etc.). Researchers have also demonstrated that parents who receive training can implement a variety of procedures (e.g., shaping, discrete trial teaching, ESDM, etc.) that result in meaningful changes for them and their children. Despite the extensive parent training literature base, there are several areas in which future research and clinical practice could focus.

Parent Demographics

One potential area future researchers should address involves expanding the descriptions of parent participants. Researchers should make a concerted effort to provide a complete description of the demographics of the parents who are participating in the training. There are demographics that could potentially affect the effectiveness of an intervention, including, but not limited to, the parents' age and gender, education level, socioeconomic status (SES), and cultural characteristics. It is common for researchers to provide information regarding age and gender; however, there are examples in which little to no demographic information is reported, and demographics, such as culture and SES, are typically never reported. Without providing demographic information, it would be difficult, if not impossible, to identify any relationship between parent variables and response to training.

Reporting demographic information to help identify the conditions under which certain training methods can lead to better skill acquisition is crucial. For example, researchers have shown that parent training may be less effective for parents of lower SES (e.g., Clark & Baker, 1983; Knapp & Deluty, 1989). Some associated challenges with this demographic, such as working multiple jobs, may result in less effective training for reasons such as time limitations or scheduling challenges.

As such, future researchers should strive to provide a complete description of the parents participating in training to allow researchers to analyze their results with respect to these demographics. As a result, researchers and clinicians could attempt to identify which demographics result in better skill acquisition with respect to certain training procedures. This would also allow for future research to investigate the best training procedures to use for different demographics to allow for all parents to better access effective parent training.

Gender is another important demographic that may influence the effectiveness of parent training. It has been reported that mothers and fathers of individuals diagnosed with ASD have different roles within the family context (Pleck & Masciadrelli, 2004), have varying levels of stress (Flippin & Crais, 2011), and interact with their children in different manners (Flippin & Crais, 2011). If gender is part of the conditions under which a certain method of parent training is effective, reporting information on parents' gender within the research is critical. Furthermore, researchers should make an effort to evaluate parent training for fathers of individuals diagnosed with an ASD because, while there have been some studies which have included fathers, it is far more common for mothers to participate thus leaving father participation vastly underrepresented (Flippin & Crais, 2011). A father's involvement, interaction styles, and stress may be different than a mother's and may influence the selection of the training procedure, format, and targets.

The culture of the parent who participates in the training is another demographic that is not commonly reported. Culture plays a large role in how a family may interact with each other and other families, handle having a child with a diagnosis, prioritize training targets, and view their role in intervention. It is difficult to examine research findings with respect to cultural aspects when information on culture is not reported. More importantly, if culture is not reported, it is a possibility that cultural characteristics were not taken into account when designing the parent training features that are under examination. Ignoring cultural characteristics, even if unintentional, could lead to failures to replicate, ineffective training, cultural insensitivity, and reduced consumer acceptability.

Measurement

The parent training literature includes a variety of ways in which researchers measure the effects of parent training. These measures include direct objective measurement of parent behavior (e.g., Neef, 1995), direct objective measurement of child behavior (e.g., Rocha et al., 2007), subjective data (e.g., Farmer & Reupert, 2013), standardized assessments (e.g., Ingersoll & Wainer, 2013b), and/or a combination (e.g., Rocha et al. 2007). One of the hallmarks of behavior analysis (and science in general) is the reliance on objective data (Cooper et al., 2007). Therefore, subjective measurement can provide valuable information regarding the parent training program (e.g., social validity) but should not be relied upon as the main measure of effectiveness.

Social Validity

An additional measurement that should be found in clinical practice is social validity (Wolf, 1978). Although social validity was not originally identified as one of the seven dimensions of ABA (Baer, Wolf, & Risley, 1968, 1987), Wolf (1978) stated that measures of social validity is how ABA would find its "heart," so that our consumers would find an opportunity to provide us with feedback. Parents should be involved from the onset of training in selection of goals and procedures to be implemented. Additionally, researchers should measure satisfaction with the results of the training with the parents and, when possible, the individuals diagnosed with ASD. Although social validity has been included in some parent training research, there are many studies in which it has not. Future researchers should make an effort to include social validity in every future study that evaluates parent training. Clinicians should also measure social validity as part of a comprehensive evaluation of their training program to ensure satisfaction by those involved in the training and to inform clinicians of any modifications to the training that may make it more socially valid for future use.

Training the Trainers

Both in future research and in clinical practice, behavior analysts must discover the most effective and efficient ways to train professionals who will be providing parent training. As mentioned earlier, the most appropriate method may differ from trainee to trainee so this is also an important area to consider to ensure that training is as effective and efficient as possible.

An important area to consider when teaching professionals to train parents is how to do so with clinical sensitivity, that is, to do so with an understanding of the struggles that parents of individuals diagnosed with ASD go through on a daily basis. It is important to teach the trainers to train parents with compassion and empathy, as well as maintaining balance between the child's individual needs and the needs of the entire family unit. These skills are critical if professionals are going to work effectively with parents. If behavior analysts are to focus on training in the absence of these skills, parents may be less likely to feel comfortable participating in training. In other words, ignoring the contingencies under which parents are operating and paying sole attention to the contingencies affecting the child's behavior may lead to ineffective or short-term changes in parent behavior. For example, identifying that a child's challenging behavior is maintained by social positive reinforcement (e.g., parent attention) and training the parent to ignore the behavior without understanding the contingencies operating for the parents may result in teaching the parent a "skill" that he/she cannot use in the natural environment. So when in a grocery store, if the child engages in challenging behavior, ignoring the child's behavior may not be the most ideal approach for the parent if providing attention to the child serves a negatively reinforcing effect for the parent.

Although these "soft skills" may be hard to conceptualize and may not be as simple to define as a more concrete procedure, such as prompting, they are critical skills that need to be taught to future parent trainers. A first step would be for future researchers to identify and operationally define all of the soft skills that are needed for trainers to effectively work with parents of children with ASD. Additionally, future researchers should evaluate ways to train soft skills to the individuals who will be providing the parent training. Finally, future researchers should evaluate if the parent trainers who were taught soft skills provided training that resulted in quicker rates of learning for the parent trainees, higher levels of parent satisfaction, and greater parental utilization of skills taught.

Training future behavior analysts how to work with parents is critical to providing a higher quality of intervention leading to better outcomes for individuals diagnosed with autism. Therefore, how to provide effective parent training should be included as a component of a behavior analysts training (e.g., undergraduate programs, graduate programs, and service providers). Pertinent parent training skills should also be required as part of certification/licensure. Thus, training the trainers is not only an important component of future research but also an important component of clinical practice.

A Progressive Model

The majority of research on parent training has focused on a professional-led training program for parents to implement a single procedure (e.g., Suess et al., 2014), a few procedures (e.g., Barton & Lissman, 2015), or how to implement a comprehensive intervention (e.g., Buckley et al., 2014). Although parent training has been used to teach parents to implement a variety of procedures, the majority of these studies presumably have taught parents to implement the procedures in a way that requires strict adherence to specific protocols. Furthermore, the underlying conceptual basis for the technique is often not trained which may lead to training parents to implement the techniques inflexibly. Training parents to follow a protocol may be easier to train, measure, and is often the current model of the field (Leaf et al. 2016); however, this type of training could be considered a prescriptive model (i.e., parents are taught to implement specific procedures under specific contextual variables) rather than a

flexible model in which the parents can make in-the-moment changes based on the child's behavior (i.e., a progressive model; Leaf et al., 2016).

Training in a progressive model consists of training the parents on the principles underlying the procedures and rationales for their use as well as on the procedures themselves. This may allow for greater overarching impact, longer maintenance, and generalization of skills (e.g., Leaf et al., 2016). Additionally, this could be considered more of a psychoeducational model in which parents develop a broader understanding of behavioral principles. Training in this model contrasts with training that is solely focused on following a specific, strict protocol (e.g., a prescriptive model).

While several studies have evaluated components of a progressive model (Leaf et al., 2016), none have specifically evaluated the model with respect to parent training. However, components of the progressive model were utilized as part of Lovaas et al. (1973) and Lovaas (1987). Within a progressive model, as applied to parent training, the parent would be trained to use clinical judgment, in-the-moment assessment and decision-making, and flexible teaching while implementing a variety of behaviorally based techniques. When parents are trained in this model, instead of adhering to a strict protocol, they would be trained to understand the principles of ABA, as well as when and how to adjust teaching and make in-the-moment assessments. Future researchers should investigate the use of this model for parent training and focus on measures of parents' clinical judgments, in-the-moment assessments and decision-making, flexibility in teaching and prompt fading, and implementation of multiple procedures simultaneously. Additional measures could include comprehension of guiding principles as opposed to learning specific, isolated procedures. Training in this way may result in long-term success for both the parent and the individual diagnosed with ASD.

Conclusion

For over 50 years, the principles of ABA have been utilized to implement interventions for individuals diagnosed with ASD (Smith, 2012). From the beginning of the applied research and clinical implementation of ABA-based procedures for individuals diagnosed with ASD, professionals have demonstrated the advantages and importance of parent training. Today, parent training has support as an evidence-based procedure (Smith & Iadarola, 2015) which can be used to instruct parents how to implement a variety of procedures (e.g., BST, DTT) to teach a wide assortment of skills (e.g., language, social, self-help). Although there are several areas that should be evaluated by future researchers and explored by clinicians, there is a breadth of evidence supporting parent training as part of a comprehensive treatment program. Providing parent training can result in better outcomes for individuals diagnosed with ASD and an improved quality of life for parents, children, and all members of the family unit.

References

Al-Khalaf, A., Dempsey, I., & Dally, K. (2014). The effect of an education program for mothers of children with autism spectrum disorder in Jordan. *International Journal for the Advancement of Counselling*, *36*(2), 175–187.

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

Anan, R. M., Warner, L. J., McGillivary, J. E., Chong, I. M., & Hines, S. J. (2008). Group Intensive Family Training (GIFT) for preschoolers with autism spectrum disorders. *Behavioral Interventions*, *23*(3), 165–180.

Anderson, A., Moore, D., & Bourne, T. (2007). Functional communication and other concomitant behaviour change following PECS training: A case study. *Behavior Change*, *24*, 1–8.

Baer, D. M., Wolf, M. M., & Risley, T. R. (1968). Some current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis*, *1*(1), 91–97.

Baer, D. M., Wolf, M. M., & Risley, T. R. (1987). Some still-current dimensions of applied behavior analysis. *Journal of Applied Behavior Analysis*, *20*(4), 313–327.

Baker, B. L., Heifetz, L. J., & Murphy, D. M. (1980). Behavioral training for parents of mentally retarded children: One-year follow-up. *American Journal of Mental Deficiency*, *85*, 31–38.

Barton, E. E., & Lissman, D. C. (2015). Group parent training combined with follow-up coaching for parents of children with developmental delays. *Infants & Young Children*, *28*(3), 220–236.

Bearss, K., Burrell, T. L., Stewart, L., & Scahill, L. (2015a). Parent training in autism spectrum disorder: What's in a name? *Clinical Child and Family Psychology Review*, *18*(2), 170–182.

Bearss, K., Johnson, C., Smith, T., Lecavalier, L., Swiezy, N., Aman, M., et al. (2015b). Effect of parent training vs parent education on behavioral problems in children with autism spectrum disorder: A randomized clinical trial. *JAMA: The Journal of the American Medical Association*, *313*(15), 1524–1533.

Ben Chaabane, D. 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.

Berquist, K. L., & Charlop, M. H. (2014). Teaching parents of children with autism to evaluate interventions. *Journal of Developmental and Physical Disabilities*, *46*, 371–389.

Bondy, A. S., & Frost, L. A. (1994). The picture exchange communication system. *Focus on Autism and Other Developmental Disabilities*, *9*(3), 1–19.

Buckley, T. W., Ente, A. P., & Ruef, M. B. (2014). Improving a family's overall quality of life through parent training in pivotal response treatment. *Journal of Positive Behavior Interventions*, *16*(1), 60–63.

Carr, E. G., & Durand, V. M. (1985). Reducing behavior problems through functional communication training. *Journal of Applied Behavior Analysis*, *18*(2), 111–126.

Charlop, M. H., & Trasowech, J. E. (1991). Increasing autistic children's daily spontaneous speech. *Journal of Applied Behavior Analysis*, *24*(4), 747–761.

Christensen, D. L., Baio, J., Braun, K. V., et al. (2012). Prevalence and characteristics of autism spectrum disorder among children aged 8 years – autism and developmental disabilities monitoring network, 11 sites. *MMWR*, *65*(3), 1–23.

Clark, D. B., & Baker, B. L. (1983). Predicting outcome in parent training. *Journal of Consulting and Clinical Psychology*, *51*, 309–311.

Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis* (2nd ed.). New York, NY: Pearson.

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.

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.

Durand, V. M., Hieneman, M., Clarke, S., Wang, M., & Rinaldi, M. L. (2013). Positive family intervention for severe challenging behavior I: A multisite randomized clinical trial. *Journal of Positive Behavior Interventions*, *15*(3), 133–143.

Estes, A., Vismara, L., Mercado, C., Fitzpatrick, A., Elder, L., Greenson, J., et al. (2014). The impact of parent-delivered intervention on parents of very young children with autism. *Journal of Autism and Developmental Disorders*, *44*, 353–365.

Farmer, J., & Reupert, A. (2013). Understanding autism and understanding my child with autism: An evaluation of a group parent education program in rural Australia. *The Australian Journal of Rural Health*, *21*(1), 20–27.

Flippin, M., & Crais, E. R. (2011). The need for more effective father involvement in early autism intervention: A systematic review and recommendations. *Journal of Early Intervention*, *33*(1), 24–50.

Forehand, R., Middlebrook, J., Rogers, T., & Steffe, M. (1983). Dropping out of parent training. *Behaviour Research and Therapy*, *21*(6), 663–668.

Harris, S. L., Wolchik, S. A., & Weitz, S. (1981). The acquisition of language skills by autistic children: Can parents do the job? *Journal of Autism and Developmental Disorders*, *11*(4), 373–384.

Harris, S. L., Wolchik, S. A., & Milch, R. E. (1983). Changing the speech of autistic children and their parents. *Child and Family Behavior Therapy*, *4*(2–3), 151–173.

Heitzman-Powell, L. S., Buzhardt, J., Rusinko, L. C., & Miller, T. M. (2014). Formative evaluation of an ABA outreach training program for parents of children with autism in remote areas. *Focus on Autism and OtherbDevelopmental Disabilities*, *29*(1), 23–38.

Herbert, E. W., & Baer, D. M. (1972). Training parents as behavior modifiers: Self-recording of contingent attention. *Journal of Applied Behavior Analysis*, *5*(2), 139–149.

Ingersoll, B., & Wainer, A. (2013a). Initial efficacy of project ImPACT: A parent-mediated social communication intervention for young children with ASD. *Journal of Autism and Developmental Disorders*, *43*(12), 2943–2952.

Ingersoll, B. R., & Wainer, A. L. (2013b). Pilot study of a school-based parent training program for preschoolers with ASD. *Autism*, *17*, 434–448.

Kasari, C., Gulsrud, A., Paparella, T., Hellemann, G., & Berry, K. (2015). Randomized comparative efficacy study of parent-mediated interventions for toddlers with autism. *Journal of Consulting and Clinical Psychology*, *83*(3), 554–563.

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.

Knapp, P. A., & Deluty, R. H. (1989). Relative effectiveness of two behavioral parent training programs. *Journal of Clinical Child Psychology*, *18*, 314–322.

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., & 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*. San Diego, CA: College-Hill Press.

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.

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.

Laugeson, E. A., Frankel, F., Mogil, C., & Dillon, A. R. (2009). Parent-assisted social skills training to improve friendships in teens with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *39*(4), 596–606.

Leaf, R. B., McEachin, J. J., & Taubman, M. (2008). *Sense and nonsense in the behavioral treatment of autism: It has to be said*. New York, NY: Different Roads to Learning.

Leaf, J. B., Tsuji, K. H., Lentell, A. E., Dale, S. E., Kassardjian, A., Tuabman, M., … Oppenheim-Leaf, M. L. (2013). A comparison of discrete trial teaching implemented in a one-to-one instructional format and in a group instructional format. *Behavioral Interventions*, *28*, 82–106.

Leaf, J. B., Leaf, R., McEachin, J., Taubman, M., Ala'i-Rosales, S., Ross, R. K., et al. (2016). Applied behavior analysis is a science and, therefore, progressive. *Journal of Autism and Developmental Disorders*, *46*(2), 720–731.

Lerman, D. C., Swiezy, N., Perkins-Parks, S., & Roane, H. S. (2000). Skill acquisition in parents of children with developmental disabilities: Interaction between skill type and instructional format. *Research in Developmental Disabilities: A Multidisciplinary Journal*, *21*(3), 183–196.

Lovaas, O. I. (1987). Behavioral treatment and normal educational and intellectual functioning in young autistic children. *Journal of Consulting and Clinical Psychology*, *55*(1), 3–9.

Lovaas, O. I., Koegel, R., Simmons, J. Q., & Long, J. S. (1973). Some generalization and follow-up measures on autistic children in behavior therapy. *Journal of Applied Behavior Analysis*, *6*(1), 131–165.

Malow, B. A., Adkins, K. W., Reynolds, A., Weiss, S. K., Loh, A., Fawkes, D., et al. (2014). Parent-based sleep education for children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, *44*(1), 216–228.

Moes, D. R., & Frea, W. D. (2002). Contextualized behavioral support in early intervention for children with autism and their families. *Journal of Autism and Developmental Disorders*, *32*(6), 519–533.

Najdowski, A. C., Wallace, M. D., Reagon, K., Penrod, B., Higbee, T. S., & Tarbox, J. (2010). Utilizing a home-based parent training approach in the treatment of food selectivity. *Behavioral Interventions*, *25*(2), 89–107.

National Standard Report. (2009). The national standards project-addressing the need for evidence-based practice, guidelines, for autism spectrum disorders, Natural Autism Center.

National Standard Report. (2015). The national standards project Phase 2-addressing the need for evidence-based practice, guidelines, for autism spectrum disorders, Natural Autism Center.

Neef, N. A. (1995). Pyramidal parent training by peers. *Journal of Applied Behavior Analysis*, *28*(3), 333–337.

Park, J. H., Alber-Morgan, S. R.. 2., & Cannella-Malone, H. (2011). Effects of mother-implemented Picture Exchange Communication System (PECS) training on independent communicative behaviors of young children with autism spectrum disorders. Topics in Early Childhood Special Education, 31(1), 37–47.

Patterson, G. R., & Fleischman, M. J. (1979). Maintenance of treatment effects: Some considerations concerning family systems and follow-up data. *Behavior Therapy*, *10*, 168–185.

Pleck, J. H., & Masciadrelli, B. P. (2004). Parental involvement by U.S. residential fathers: Levels, sources, and consequences. In M. E. Lamb (Ed.), *The role of the father in child development* (4th ed.pp. 222–271). Hoboken, NJ: Wiley.

Poslawsky, I. E., Naber, F. B., Bakermans-Kranenburg, M. J., van Daalen, E., van Engeland, H., & van IJzendoorn, M. H. (2015). Video-feedback intervention to promote positive parenting adapted to autism (VIPP-AUTI): A randomized controlled trial. *Autism*, *19*(5), 588–603.

Powers, L. E., Singer, G., & Stevens, T. (1992). Behavioral parent training in home and community generalization settings. *Education and Training in Mental Retardation*, *27*(1), 13–27.

Radley, K. C., Jenson, W. R., Clark, E., & O'Neill, R. E. (2014). The feasibility and effects of a parent-facilitated social skills training program on social engagement of children with autism spectrum disorders. *Psychology in the Schools*, *51*(3), 241–255.

Reagon, K. A., & Higbee, T. S. (2009). Parent-implemented script fading to promote play-based verbal initiations in children with autism. *Journal of Applied Behavior Analysis*, *42*(3), 659–664.

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.

Sallows, G. O., & Graupner, T. D. (2005). Intensive behavioral treatment for children with autism: Four-year outcome and predictors. *American Journal on Mental Retardation*, *110*, 417–438.

Samadi, S. A., & Mahmoodizadeh, A. (2014). Omid early intervention resource kit for children with autism spectrum disorders and their families. *Early Child Development and Care*, *184*(3), 354–369.

Schreibman, L., Kaneko, W. M., & Koegel, R. L. (1991). Positive affect of parents of autistic children: A comparison across two teaching techniques. *Behavior Therapy*, *22*(4), 479–490.

Seiverling, L., Williams, K., Sturmey, P., & Hart, S. (2012). Effects of behavioral skills training on parental treatment of children's food selectivity. *Journal of Applied Behavior Analysis*, *45*(1), 197–203.

Sharp, W. G., Burrell, T. L., & Jaquess, D. L. (2014). The autism MEAL plan: A parent-training curriculum to manage eating aversions and low intake among children with autism. *Autism*, *18*(6), 712–722.

Smith, T. (2012). Evolution of research on interventions for individuals with autism spectrum disorder: Implications for behavior analysts. *The Behavior Analyst Today*, *35*(1), 101–113.

Smith, T., & Iadarola, S. (2015). Evidence base update for autism spectrum disorder. *Journal of Clinical Child & Adolescent Psychology*, *44*(6), 897–922.

Smith, T., Groen, A. D., & Wynn, J. W. (2000). Randomized trial of intensive early intervention for children with pervasive developmental disorder. *American Journal on Mental Retardation*, *105*(4), 269–285.

Stokes, T., & Baer, D. (1977). An implicit technology of generalization. *Journal of Applied Behavior Analysis*, *10*(2), 349–367.

Suess, A. N., Romani, P. W., Wacker, D. P., Dyson, S. M., Kuhle, J. L., Lee, J. F., et al. (2014). Evaluating the treatment fidelity of parents who conduct in-home functional communication training with coaching via telehealth. *Journal of Behavioral Education*, *23*(1), 34–59.

Symon, J. B. (2005). Expanding interventions for children with autism: Parents as trainers. *Journal of Positive Behavior Interventions*, *7*(3), 159–173.

Tager-Flusberg, H., Paul, R., & Lord, C. (2005). Language and communication in autism. In F. R. Volkmar, R. Paul, A. Klin, & D. Cohen (Eds.), *Handbook of autism and pervasive developmental disorders* (3rd ed.pp. 335–364). Hoboken, NJ: Wiley and Sons.

Tiger, J. H., Hanley, G. P., & Bruzek, J. (2008). Functional communication training: A review and practical guide. *Behavior Analysis in Practice*, *1*(1), 16–23.

Vismara, L. A., Colombi, C., & Rogers, S. J. (2009). Can one hour per week of therapy lead to lasting changes in young children with autism? *Autism*, *13*(1), 93–115.

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*, *43*(12), 2953–2969.

Wacker, D. P., Berg, W. K., Harding, J. W., Barretto, A., Rankin, B., & Ganzer, J. (2005). Treatment effectiveness, stimulus, generalization, and acceptability to parents of functional communication training. *Educational Psychology*, *25*, 233–256.

Wacker, D. P., Lee, J. F., Padilla Dalmau, Y. C., 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.

Wolf, M., Risley, T., & Mees, H. (1963). Application of operant conditioning procedures to the behaviour problems of an autistic child. *Behaviour Research and Therapy*, *1*(2), 305–312.

Wolf, M. M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis*, *11*(2), 203–214.

Yoo, H. J., Bahn, G., Cho, I. H., Kim, E. K., Kim, J. H., Min, J. W., et al. (2014). A randomized controlled trial of the Korean version of the PEERS® parent-assisted social skills training program for teens with ASD. *Autism Research*, *7*(1), 145–161.