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Follow-Up to an Early Intervention for Parents of Young Children With or At-Risk for Autism
Spectrum Disorder

An honors thesis presented to the
Department of Psychology,
University at Albany, State University of New York
in partial fulfillment of the requirements
for graduation with Honors in Psychology
and
graduation from The Honors College.

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Abstract

The goal of this research was to study a training program for parents of young children with or at genetic risk for autism and assess the program's impact on self-reported parent stress levels and competence beliefs. The current study was part of a larger parent training project at the Center for Autism and Related Disabilities (CARD) at the University at Albany, State University of New York. Parents completed assessment measures of stress, knowledge, and competence at pre-training, post-training, and again six weeks following the completion of the parent training. Paired samples *t*-tests were used to assess for significant changes in parent scores between pre-training and follow-up and between post-training and follow-up. Neither stress nor competence scores at follow-up were significantly different from scores at pre-training or post-training. Knowledge scores at follow-up were significantly different from scores at pre-training but not from scores at post-training. Despite the limitations of the study due to small sample size, the results are discussed in terms of how they relate to previous research on similar parent training programs.

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Follow-Up to an Early Intervention for Parents of Young Children With or At-Risk for Autism
Spectrum Disorder

Autism Spectrum Disorder (ASD) is a neurodevelopmental disorder that involves difficulties with social communication and the presence of restricted and repetitive interests and behaviors (American Psychiatric Association, 2013). As a spectrum disorder, there is variability in the abilities and severity of difficulties present in individuals with ASD. Behaviors that accompany ASD can be seen within the first two years of life, and some behaviors can even be observed within the first year of life (Zwaigenbaum, Bryson, & Garon, 2013).

It has been stressed that early intervention services should start as early as possible to help children with ASD have more positive outcomes later in life (Koegel, Koegel, Ashbaugh, & Bradshaw, 2014). Past research has shown that early intervention services can have very positive effects on children with ASD. For example, studies on one method of intervention, the Early Start Denver Model (ESDM; Rogers & Dawson, 2010), have demonstrated beneficial outcomes for children with ASD. The ESDM has been described as a “comprehensive early behavioral intervention for infants to preschool-aged children with ASD that integrates applied behavior analysis (ABA) with developmental and relationship-based approaches” (Dawson et al., 2010, p. 18).

One of the studies evaluating the ESDM used a randomized controlled trial design where children between the ages of 18 and 30 months with autism or PDD-NOS were assigned to either an ESDM intervention group or a control group (Dawson et al., 2010). Children in the ESDM group received two years of ESDM sessions with a therapist, and their parents also received some training in the ESDM. Interventions in the community were suggested for children in the control group. Children were evaluated at the beginning of the study, one year into the study,

and either two years into the study or when the child turned four years old. After one year, children in the ESDM group showed a greater improvement in IQ scores than the control group. After two years, children in the ESDM group showed better outcomes in language abilities, adaptive behavior, and overall diagnosis compared to children in the control group. The authors suggested that the positive results seen in the study may have been partially due to parent involvement in the intervention.

Some research on early intervention and ASD has focused on parent involvement in early intervention services. Research has examined the extent to which parents can be trained to implement interventions and how children benefit from parent-delivered treatment approaches. Evidence suggests that interventions delivered by parents may lead to positive outcomes for their children. McConachie and Diggle (2007) conducted a review of 12 research studies evaluating parent-delivered interventions. The researchers acknowledged that some of the studies included in their review had methodological limitations. However, the authors also noted that parent-delivered interventions appear to offer some benefits in terms of child social communication and parent knowledge. One study included in the review was conducted by Drew et al. (2002) who found that children of parents participating in a parent training program showed greater improvements in language abilities compared to children of parents not participating in parent training. A study conducted by Aldred, Green, and Adams (2004) was also included in the review. Results indicated that children exhibited greater gains in their level of ASD symptoms, language abilities, and interactions if their parent received training compared to children receiving treatment as usual.

Green et al. (2010) used a larger sample than Aldred et al. (2004) to compare outcomes for children receiving treatment in the community whose parents either were or were not also

receiving a parent intervention. Unlike the results of Aldred et al. (2004), Green et al. (2010) found no difference in child ASD symptoms between the two groups. However, as in Aldred et al. (2004), findings revealed that parent-child interactions improved for those in the parent training group.

Another study included in the McConachie and Diggle (2007) review was conducted by Koegel, Bimbela, and Schreibman (1996) which examined the effects of parent training on levels of “happiness, interest, stress, and communication style” during interactions between parents and their child with ASD (p. 353). The purpose of this study was to compare two types of parent intervention models: the Individual Target Behavior condition, or ITB, versus the Pivotal Response Training condition, or PRT (Koegel et al., 1996). Individual Target Behavior training involved teaching parents how to manage child behaviors, whereas the Pivotal Response Training involved teaching parents how to be more responsive to their child and how to help motivate their child during interactions. Interactions between each parent and child were rated on the four areas listed above both before and after parents were trained in one of the two intervention methods. Results indicated that parent-child interactions improved following intervention for parents trained in PRT but not for parents trained in ITB. The authors concluded that parent training may result in positive outcomes for parents of children with ASD, but it may also depend on the type of training parents receive.

Results from the Koegel et al. (1996) study may demonstrate beneficial effects of parent training programs on stress levels. This is an important area of focus as evidence suggests that parents of children with ASD have high levels of stress. Estes et al. (2013) found that parents of children with ASD reported higher levels of stress compared to parents of children ages 18–30 months with either a developmental delay or with typical development. The researchers also

found that parents of children with ASD typically reported higher levels of problem behavior than did parents of children with either typical development or a developmental delay. Results indicated that reported problem behavior scores predicted reported stress scores, however, other variables not investigated in the study may influence stress levels as well. For example, deficits in the development of social skills have also been associated with stress levels for parents of children with ASD (Davis & Carter, 2008). Estes et al. (2013) suggested that because problem behavior contributes to stress levels, parents may benefit from learning techniques to modify maladaptive behavior.

Not only can stress negatively affect parents, it may also adversely affect their child. Osborne, McHugh, Saunders, and Reed (2008) measured the reported stress levels of parents before their child began receiving intervention services and then again 9-10 months after intervention. The study included children receiving different types of intervention services rather than focusing on one specific intervention method. Number of hours of intervention services each child received was recorded and child development, cognitive ability, and adaptive behavior were evaluated. Parents and their children were placed into one of four groups based on whether parents reported a high or low level of stress and whether children received a high or low number of hours of intervention. Results indicated that children who received a higher number of hours of intervention showed a greater improvement in outcomes compared to children who received a lower number of intervention hours. However, the greater improvement demonstrated when comparing high versus low intervention hours only occurred in the low parent stress groups. Children of parents that reported high stress showed the same level of improvement regardless of whether the child received a higher or lower number of intervention hours. Findings from this study demonstrate that parent stress levels may impact how much a

child improves from receiving intervention services. It should be noted, however, that other studies have not found a connection between parent stress levels prior to their child beginning an intervention program and child improvement (Eikeseth, Klintwall, Hayward, & Gale, 2015).

In addition to parent stress, research has also focused on parent self-efficacy and competence views. Hastings and Brown (2002) studied levels of teacher-reported problem behavior in children with ASD and parent-reported levels of depression, anxiety, and self-efficacy. For mothers, results indicated that self-efficacy acted as a mediator for the relationship between problem behavior and parent anxiety and depression. For fathers, results indicated that the association between child problem behavior and parent anxiety was moderated by levels of self-efficacy. In other research, self-efficacy has been shown to be negatively correlated with parent guilt, depression, and stress, and positively correlated with parent agency, which is described as how actively involved parents are with their child (Kuhn & Carter, 2006). As a result of these types of findings on parent self-efficacy, it has been suggested that future research and interventions look at ways to improve self-efficacy (Hastings & Brown, 2002; Kuhn & Carter, 2006).

A study conducted by Keen, Couzens, Muspratt, and Rodger (2010) examined stress and competence levels of parents of young children with ASD. Over a 6-week period, parents participated in either a “professionally-supported” parent training or a “self-directed” training where parents had access to a video-based program with suggested assignments (Keen et al., 2010). Assessments were completed prior to starting the training program and then again three months after the 6-week training period. Results indicated that parents in the professionally-supported training reported lower levels of stress than those in the self-directed video-based training. Parents also completed the *Parenting Sense of Competence* scale (PSOC; Johnston &

Mash, 1989) which was used to measure self-reported views of competence. Satisfaction and efficacy subscales are included in this measure. There was not a difference in scores between groups on the satisfaction subscale, however, differences were found on the efficacy subscale based on initial efficacy score and training group. When initial efficacy scores were high, parents in the professionally-supported group reported lower efficacy scores at follow-up compared to parents in the self-directed group. When initial efficacy scores were low, parents in the professionally-supported group reported higher self-efficacy scores at follow-up compared to parents in the self-directed group (Keen et al., 2010). According to the study, the professionally-supported parent training, as opposed to the self-directed training, appeared to lower stress levels and also increase efficacy views if those views were initially low.

As previously mentioned, the ESDM has demonstrated positive effects for children with ASD (Dawson et al., 2010). More recently, the ESDM has been studied as a parent-delivered intervention. Vismara, Colombi, and Rogers (2009) trained parents in the ESDM over 12 weeks during one 1-hour session each week. Researchers examined the extent to which parents were able to learn and use ESDM skills, along with child progress in social communication abilities, over a 12-week period and also at follow-up points after the training. The majority of parents who participated in the training were able to master the ESDM skills by the end of the program and continued to demonstrate these skills at follow-up assessments. In addition, their children showed improvement in their social communication behaviors during the training program and also at follow-up assessments. Results of this study indicated that it was possible for parents to learn the skills used in implementing the ESDM while their child also showed improvement in their communication and interactions during that time period (Vismara et al., 2009).

Continuing to study the ESDM as a parent training, Rogers, Estes, et al. (2012) conducted a randomized controlled trial of a parent ESDM training. Parents of children with ASD between 12 and 24 months of age were randomly assigned to either a parent version of the ESDM or to community treatment. The impact of a parent-ESDM training on child outcomes was a focus of this study. Parents completed assessments before and after the 12-week training period. Parents in the parent-ESDM group participated in a 1-hour session each week for 12 weeks with their child and a therapist. Parents in the community group participated in various interventions offered in their community.

Results of the Rogers, Estes, et al. (2012) study did not support three of their initial four hypotheses. In contrast to what was expected, there was no difference between groups in child assessment variables, extent to which parents used ESDM strategies, or whether certain child characteristics influenced the effects of ESDM versus community intervention for children. However, as expected, there was a better relationship between the parent and therapist for those in the parent-ESDM group than for those in the community group. The authors suggested that not knowing which methods or interventions were included in community treatment may have made it harder to differentiate the parent-ESDM training from the community training. It was also suggested that changes in child variables may not have been seen until further out than the 12-week point used (Rogers, Estes, et al., 2012).

As an addition to the Rogers, Estes, et al. (2012) study, Estes et al. (2014) looked at both stress levels and competence beliefs in the parents that took part in the ESDM parent training program versus parents involved in community services. To assess parent stress levels and competence beliefs, parents completed both the *Questionnaire on Resources and Stress* (QRS; Konstantareas, Homatidis, & Plowright, 1992) and the *Parenting Sense of Competence* scale

(PSOC; Johnston & Mash, 1989), respectively. Assessments were completed prior to the start of the training program and again 12 weeks later at the completion of the training program. No differences were found between the two groups of parents when looking at scores on the PSOC. Differences did exist in scores on the QRS between the two groups. Parents in the community group reported increased stress levels over 12 weeks, whereas parents in the ESDM training group did not report increases in their levels of stress. The authors suggested that changes may not have been evident in PSOC scores because the intervention only lasted for 12 weeks, which is considered to be short-term. It was noted that either a longer training period or a longer time frame between assessments may have resulted in differences in PSOC scores.

Purpose

Past research has indicated that parents of children with ASD have high levels of stress (Estes et al., 2013). Research has also suggested that levels of self-efficacy are related to reported levels of parent depression, anxiety (Hastings & Brown, 2002), stress, and guilt (Kuhn & Carter, 2006). Other research has demonstrated that it is possible for parents to implement intervention services for their child with ASD and that this may benefit parents in terms of their stress levels and competence beliefs. While research on parent-implemented interventions has been conducted on various intervention models, many of the studies discussed here have focused on the ESDM. Some of the studies mentioned also evaluated parent outcome measures before and after a parent training program but did not include a follow-up assessment. The purpose of the current research project is to evaluate the follow-up effects of participation in an ESDM-based parent training program on parent stress, competence beliefs, and knowledge.

Methods

Participants

The current research project was part of a larger dissertation project at the Center for Autism and Related Disabilities (CARD) at the University at Albany, State University of New York. For inclusion in the study, parents needed to have a child between the ages of 12 and 48 months who was diagnosed with or at genetic risk for ASD. At genetic risk for ASD indicated that the child had an older sibling previously diagnosed with ASD. Parents who met these criteria, were available to attend all training sessions, and expressed interest in participating were screened for inclusion in the study. A total of 10 parents participated in the study.

Measures

Parent competence. The *Parenting Sense of Competence* scale (PSOC; Johnston & Mash, 1989) was used to assess self-reported views of parent competence before and after parent training and also at follow-up. The PSOC contains 16 statements with responses consisting of “strongly agree,” “agree,” “mildly agree,” “mildly disagree,” “disagree,” and “strongly disagree,” which are scored using values from 1 to 6. Some statements are reverse scored. Higher scores demonstrate higher competence views. The PSOC consists of two subscales, Satisfaction and Efficacy (Johnston & Mash, 1989; Ohan, Leung, & Johnston, 2000), both of which were used in the current data analyses. Total PSOC score was also used in the analyses. Statements included in the PSOC relate to the views parents have of raising a child, such as “Being a parent makes me tense and anxious,” along with views of how effective they are as a parent, such as “If anyone can find the answer to what is troubling my child, I am the one.”

Parent stress. The *Parenting Stress Index, Forth Edition, Short Form* (PSI-4 SF; Abidin, 2012) was also completed by parents at pre- and post-training and follow-up. It contains 36

statements about various aspects of parenting that are potentially stressful. Responses include “Strongly Agree,” “Agree,” “Not Sure,” “Disagree,” and “Strongly Disagree.” These responses are scored on a scale of 1 to 5, where higher scores indicate higher levels of stress. Statements include, “I often have the feeling that I cannot handle things very well” and “My child seems to cry or fuss more often than other children.” There are three subscales on the PSI, however, only the total PSI score was used in analyses.

Parent knowledge. Parents also completed a 10 question knowledge assessment developed by the Center for Autism and Related Disabilities which contained both general questions about ASD and questions more specific to the current training program. Sample questions include “Which of the following is a form of nonverbal communication that is often absent among young children with autism spectrum disorder?” and “According to the Early Start Denver Model, what is the purpose of engaging in sensory social routines?” All questions were presented in multiple-choice format with four possible answer choices. The score on this measure was reported as a percentage, and parents completed the measure pre- and post-training and also at follow-up.

Child vocabulary. The *MacArthur-Bates Communicative Developmental Inventories* (CDI; Fenson et al., 2007), *Words and Sentences Form* was used to obtain parent report of each child’s vocabulary. The *Words and Sentences Form* contains 22 subsections, each of which includes a list of words in a specific topic area. Parents indicate which words their child has previously used. Sample topic areas include “toys,” “food and drink,” “small household items,” “outside things,” and “descriptive words.” There are 680 words listed in the vocabulary checklist, and a child’s score on the measure is the total number of words from all of the subsections.

Autism symptoms. The *Autism Diagnostic Observation Schedule-2* (ADOS-2; Lord et al., 2012) was used to assess level of ASD symptoms present in each child before starting the parent training program. The *ADOS-2* consists of multiple activities partially directed by the examiner during which the child is evaluated for ASD-related behaviors and possible lack of behaviors expected given the age of the child. The *ADOS-2* consists of several modules, and the specific module used during administration is based on the age and verbal ability level of the individual. Given the age and verbal level of the participants' children, either Module 1 or the Toddler Module of the *ADOS-2* was administered to each child. Scoring of the *ADOS-2* results in a comparison score that indicates the severity of ASD symptoms seen during the *ADOS-2* assessment period.

Procedure

Design. The study took place over a 12-week period. Prior to the start of the study, each child was assessed using the *Autism Diagnostic Observation Schedule-2* (Lord et al., 2012). The 10 participating parents were then randomly assigned to either the treatment group or the waitlist control group, resulting in five parents per group. The treatment group attended training sessions during the first six weeks of the study. The waitlist control group attended training sessions during the second six weeks of the study.

Assessments. Parents were asked to complete the *Parenting Sense of Competence* scale, the *Parenting Stress Index, Forth Edition, Short Form*, the knowledge assessment, and the *MacArthur-Bates Communicative Developmental Inventories Words and Sentences Form* at three time points over the 12-week period of the study: prior to the start of the study and at both 6 and 12 weeks post-baseline. Assessment 12 weeks past the start of the study served as a post-training assessment for the waitlist control group and a 6-week follow-up assessment for the

treatment group. Assessment prior to the start of the study and 6 weeks post-baseline served as pre- and post-training assessment points, respectively, for the treatment group. The goal of the current research project was to evaluate the follow-up effects of participation in the Early Start Denver Model parent training program. Data for the treatment group was analyzed for the current project to be able to include a 6-week follow-up assessment point to compare to the pre- and post-training assessment points. Each of the five parents in the treatment group was sent a link to an online survey containing the same assessment measures completed pre- and post-training. The survey was developed using Survey Monkey.

Intervention. The parent training program was based on the parent version of the Early Start Denver Model (ESDM; Rogers, Dawson, & Vismara, 2012). Parents attended twelve small group training sessions for 60 to 90 minutes, twice per week, for six weeks. One topic was covered during each session, and the session topics included: an introduction to the program including general ASD and services-related information; getting the child's attention; sensory social routines; turn-taking during interactions; nonverbal communication; imitation; learning principles; joint attention; play skills; pretend play; basics of speech; a wrap up and conclusion of the program (Rogers, Dawson, et al., 2012). The parent training program was administered by a graduate student at the Center for Autism and Related Disabilities. Each session included a review of the topic, examples of and suggestions for using strategies and techniques, and opportunities for parents to ask questions and clarify material.

Analyses. Initial descriptive statistics were obtained using SPSS to look at the mean and spread of scores on each of the measures administered before the start of the parent training program. To assess for potential differential attrition, independent samples *t*-tests were completed to determine if differences existed prior to intervention between participants who

completed follow-up measures (3 parents) and those who did not complete follow-up measures (2 parents).

Data were analyzed using paired samples *t*-tests with SPSS. Tests compared mean score at pre-training to mean score at follow-up and mean score at post-training to mean score at follow-up on each of the following measures: *Parenting Sense of Competence Efficacy*, *Parenting Sense of Competence Satisfaction*, *Parenting Sense of Competence Total*, *Parenting Stress Index Total*, and *Knowledge Total*. Ten pairs of data were used in the analyses.

Results

Three of the five parents who participated in the training program completed the follow-up measures. All parents were mothers. Of the parents who completed the follow-up assessment, two of the children were male and one was female. The *ADOS-2* Module 1 administered pre-training resulted in comparison scores for the three children within the moderate and high ranges of ASD symptoms. Mean child age was 35.23 months ($SD=.85$). There were no significant differences found between parents that completed follow-up assessments and those that did not complete follow-up assessments within the treatment group on any of the pre-training assessment scores, nor were there significant differences on child age or *ADOS* comparison scores. Descriptive statistics for children of parents who completed follow-up measures are presented in Table 1. The Shapiro-Wilk test of normality (Shapiro & Wilk, 1965) was significant for *MacArthur-Bates Communicative Developmental Inventories* vocabulary prior to the start of the parent training program ($p=.048$; data not shown).

Knowledge was the only measure found to have a significant difference between pre-training and follow-up ($p=.010$; see Table 2). None of the other pre-training to follow-up comparisons were significant (Table 2). None of the measures were found to have a significant

difference between post-training and follow-up (Table 3), indicating that parents did not significantly change in terms of their reported stress, competence, or knowledge scores during this time period. Although changes in competence and stress scores were not significant, the mean scores reported for both competence and stress at each assessment suggest an improvement in these areas for participants over time. Mean PSOC Total score increased from pre-training to post-training. Mean PSOC Total score was lower at follow-up compared to post-training, however, mean PSOC Total score at follow-up remained higher than the mean PSOC Total score reported pre-training. Mean PSI score decreased from pre-training to post-training. Mean PSI score was higher at follow-up compared to post-training, however, mean PSI score at follow-up remained lower than the mean PSI score reported pre-training.

Discussion

The purpose of this study was to evaluate the follow-up effects of participation in an Early Start Denver Model parent training program on parent reported stress, competence, and knowledge. Parents scored significantly higher on the knowledge assessment at follow-up compared to pre-training. This finding indicates that parents increased their ASD and program related knowledge over the 12-week period of the study.

It is somewhat surprising that there was not a significant difference in parent stress or parent competence scores between pre-training and follow-up. To some extent, this finding is in agreement with that of Estes et al. (2014) who found no difference between pre- and post-training scores on parent efficacy, satisfaction, and overall competence beliefs. It was suggested by the authors that the brief 12-week design of the program without a follow-up may not have been a sufficient period of time for a difference in these areas to be detected. The current project also measured parent competence, including efficacy and satisfaction, over a 12-week time

frame, however, assessments were conducted at pre-training, post-training, and 6-week follow-up. No differences were found in parent competence between pre-training and follow-up nor between post-training and follow-up, reinforcing findings from Estes et al. (2014) that scores on these measures did not change over a 12-week timeline. Although the 12-week assessment point in the current study served as a 6-week follow-up rather than a post-training point as in Estes et al. (2014), results are in agreement with previous research suggesting that the “full benefit of parent implemented interventions may be cumulative and longer term intervention might have made a more significant impact” (Estes et al., 2014, p. 362). The concept of needing a longer time frame to assess changes in competence views is strengthened by the results of Keen et al. (2010) who did find changes in self-efficacy using the efficacy subscale of the *Parenting Sense of Competence* scale (Johnston & Mash, 1989). In the study conducted by Keen et al. (2010), parents completed assessment measures prior to starting a 6-week training program and again three months after completing the training program, allowing for a longer period of time between the two assessment points than either the current study or that of Estes et al. (2014).

Although results of the current study indicate that parents did not report significant changes or improvements in stress or competence, parent outcomes are an important area to study further. Parents of children with ASD have reported higher levels of stress compared to other parents (Estes et al., 2013), and high parent stress may limit the progress children are able to make in intervention programs (Osborne et al., 2008). In addition, past research findings indicate that parent reported self-efficacy plays an important role in how child problem behavior relates to parent reported anxiety and depression (Hastings & Brown, 2002). Evidence suggests that parent training programs may reduce parent stress (Estes et al., 2014) and improve parent

reported competence (Keen et al., 2010), and it is important to continue to address parent stress and competence in future research.

When considering results of the current study, it is important to note the small sample size is a limitation. The small number of participants makes it difficult to accurately assess changes in scores between time points. Initial design of the project was to compare follow-up data to pre- and post-training data for all five of the parents in the treatment group of the larger research study at CARD. However, two of the five parents in the treatment group did not complete the follow-up assessment, leaving data from only three parents to include in analyses. Although analyses indicate no significant differences pre-training between the three parents who completed follow-up assessment and the two parents who did not, it is again difficult to accurately assess the extent to which these subgroups differed because of the small sample size.

Although the sample size is small, it is interesting to consider aspects of the sample and data that could influence future research. One important aspect of the data to note is the wide variation in the reported vocabulary size of children at pre-training within the three parents making up the sample for the current project. Variability on the *MacArthur-Bates Communicative Developmental Inventories Words and Sentences* resulted in a significant result ($p=.048$) with the Shapiro-Wilk test of normality (Shapiro & Wilk, 1965). Of the measures included in the analyses, the *MacArthur-Bates Communicative Developmental Inventories Words and Sentences* was the only measure to be significant on this test. Two of the children had few, if any, words, while one was reported to be quite verbal. Differences in parent-reported child vocabularies is one example of the varying abilities seen in children with ASD. As indicated by Koegel et al. (2014), “the heterogeneity of individuals diagnosed with ASD makes it difficult to

ascertain which participants respond to a specific intervention and to what degree” (p. 53).

Within the current sample there were two children who were reported to be minimally or non-verbal with another reported to be verbal, demonstrating the concept of heterogeneity.

Variability in characteristics of ASD may influence the extent to which programs benefit those affected by this disorder. When assessing the extent to which interventions and parent-trainings affect parents and their children, it is important to consider how these effects differ based on varying parent characteristics in addition to varying child characteristics. For example, results of Keen et al. (2010) indicate that the extent to which parents showed improvements in reported self-efficacy after participating in a parent-training program depended on their initial self-efficacy level. Therefore, it is important to understand the parent and child characteristics that play into the effectiveness of a parent-training program and ultimately how both parent and child are affected following participation in parent-training programs.

Multiple studies have been conducted on training programs for parents of children with ASD. Many have demonstrated some level of improvement in reported parent stress or parent competence after completing a parent training program. The results of the current study demonstrate that the participating parents improved their ASD and program related knowledge, but they did not significantly improve in their reported stress or competence. However, it is important to recognize the limitations of the current study due to the small sample size. Parent training programs do appear to benefit parents to some extent, and these types of programs should continue to be studied with larger samples. Future research should continue to consider how varying characteristics of parents and their children influence the level of impact of parent training programs in order to ultimately benefit parents and their children to the greatest extent possible.

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Table 1

Pre-Training Child Characteristics

	<i>M</i>	<i>SD</i>
Child age (months)	35.23	0.85
ADOS SA	15.00	3.61
ADOS RRB	5.67	2.08

Note. ADOS = Autism Diagnostic Observation Schedule; SA = Social Affect; RRB = Restricted and Repetitive Behavior

Table 2

Mean scores pre-training and at 6-week follow-up

	Pre-Training		Follow-Up		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Knowledge*	0.60	0.10	0.93	0.06	0.01
PSOC Total	62.00	10.54	66.67	6.81	0.35
PSOC Satisfaction	35.00	2.00	35.33	4.73	0.89
PSOC Efficacy	27.00	8.54	31.33	2.08	0.40
PSI-4 SF	99.00	8.00	93.33	20.21	0.51

Note. PSOC = Parenting Sense of Competence; PSI = Parenting Stress Index-4, Short Form

* $p < .05$

Table 3

Mean scores post-training and at 6-week follow-up

	Post-Training		Follow-Up		<i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Knowledge	0.83	0.12	0.93	0.06	0.23
PSOC Total	68.00	3.61	66.67	6.81	0.63
PSOC Satisfaction	37.67	2.52	35.33	4.73	0.63
PSOC Efficacy	30.33	5.51	31.33	2.08	0.67
PSI-4 SF	92.33	13.05	93.33	20.21	0.84

Note. PSOC = Parenting Sense of Competence; PSI = Parenting Stress Index-4, Short Form