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Pyramidal Parent Training for Children with Autism Spectrum Disorder in Southeast Europe

Laura Lyn Knecht
Brigham Young University

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Laura Lyn Knecht

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Blake D. Hansen, Chair
Terisa P. Gabrielsen
Grant H. Lundberg

Department of Counseling Psychology and Special Education

Brigham Young University

ABSTRACT

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Laura Lyn Knecht
Department of Counseling Psychology and Special Education, BYU
Educational Specialist

Families of children with autism spectrum disorder (ASD) in developing countries may not have as much access to needed behavioral services as families living in developed countries. Caregivers of children with ASD in developing countries would benefit from an affordable, efficient parent training to teach them behavior techniques to use with their children. Pyramidal training is a cost-efficient method of training individuals through peers and would be a supportive intervention for families in developing countries. This study used a repeated acquisition design across three variables to examine whether a caregiver could train another caregiver on three behavioral interventions. These interventions were appropriately redirecting repetitive behaviors, using praise, and requesting eye contact. The study also examined if the caregivers could acquire the three skills and the extent caregivers were receptive to this training model based on their comments about the training. The participants were six ethnic Macedonians or Albanians between the ages of 38 and 43 who were caregivers of a child with ASD. The results indicate the caregivers were able to train another caregiver on three skills for working with their child with autism, all the caregivers were able to acquire the three skills, and the training model's goals were socially appropriate based on participants' comments. This implicates professionals such as doctors, social workers, behavioral therapists, or school psychologists could use this form of parent training to share information throughout a family in order to benefit children with disabilities and their families.

Keywords: pyramidal training, autism spectrum disorder, parent training, repetitive behaviors, developing country, behavioral intervention

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DESCRIPTION OF THESIS STRUCTURE

This thesis, *Pyramidal Parent Training for Children with Autism Spectrum Disorder in Southeast Europe*, is written as a traditional thesis with the literature review included in the body of the paper. Training protocols described within the thesis are presented in Appendix A. Appendix B contains the research participation consent information in English. This consent form was translated into Albanian and Macedonian for research participants.

Introduction

Studies suggest that poverty can be both a cause and a consequence of intellectual disabilities within families (Emerson, 2007; Fujiura, Park, & Rutkowski-Kmitta, 2005). The relationship between disabilities and poverty could cause families who need the most help, particularly those in developing countries, to be unable to access the resources they need. Through the development of a free and convenient system for passing vital and relevant information to those caregivers who need it most, more caregivers gain access to knowledge that will help them improve how they interact with their children. One successful and cost-effective way to pass along this information is through pyramidal training (Kuhn, Lerman, & Vorndran, 2003; Loughrey et al., 2014; Neef, 1995).

Extensive research shows that parents can successfully learn interventions and then use them with their children, leading to benefits for the family as a whole and for the child as an individual (Brookman-Frazee, Stahmer, Baker-Ericzen, & Tsai, 2006). One limitation of this research is that the parent training generally ends with parents' initial receipt of the training. Very few studies have been conducted in which parents are not only trained, but also act as trainers themselves. Additionally, out of those few studies conducted in which parents do act as trainers, even fewer involve parents training other caregivers within the same family (Kuhn et al., 2003; Loughrey et al., 2014; Symon, 2005). Finally, almost all of these previous studies have been conducted within the United States. A free and easily accessible system for passing on valuable information could be helpful to families throughout the world, especially those living within developing countries.

This study seeks to inform families, the most influential group for a child, on behavior interventions for children with autism. Since caregivers generally spend more time with their

child than anyone else does, it is logical that they should be the individuals targeted for training on skills to help them work more effectively with their child. As parents become more informed on appropriate practices to use with their child, both their lives and their child's life will improve. By developing a convenient system to pass on information to caregivers who need it the most, more families can access knowledge to improve how they interact with their children.

Statement of Purpose

This study will add to the literature by showing that (a) caregivers can train another family member on behavioral strategies for working with their child with autism, (b) the family member being trained can learn the skills from another caregiver, and (c) pyramidal training within families can be effective within the setting of a developing country. The purpose of this study is to determine if a caregiver of a child with autism can effectively train other caregivers on behavior interventions they have been taught. The three common behavior interventions for a child with autism used in this study are requesting eye contact, giving praise, and redirecting repetitive behaviors (Martinez & Betz, 2013; Smith, Greenberg, Seltzer, & Hong, 2008). It is predicted that a caregiver of a child with autism will be able to train another caregiver of that same child on those skills to 80% acquisition for each skill taught.

Research Questions

The study will seek to answer the following research questions:

1. After being trained by a professional, can a caregiver train another caregiver to appropriately redirect repetitive behaviors, use praise, and request eye contact?
2. Can each caregiver acquire the three skills?
3. To what extent are the caregivers receptive to this training model based on their unprompted comments about the training?

My research hypothesis is that caregivers will effectively train another caregiver in three skills for working with their child with ASD; the caregivers will acquire the three skills; and the majority of the unprompted comments made by the caregivers will be receptive of the goals and procedures of the study.

Literature Review

Autism Spectrum Disorder

Autism spectrum disorder (ASD) is a developmental disorder characterized by poor communication skills and repetitive patterns of behavior (American Psychiatric Association [APA], 2013). Poor communications skills often include deficits in developing mutuality with people, creating and maintaining social relationships, and nonverbal communication. Repetitive patterns of behavior can include stereotypic behavior, rigid routines, and intense and restricted interests. In 2013, the diagnostic criteria broadened to include hyper- or hypo-sensitivities (e.g., a sensitivity to smells or bright lights; APA, 2013). Individuals with autism comprise about 1% of the world's population, and the Centers for Disease Control and Prevention (CDC) prevalence study found 1 in 68 children who are 8 years old in the United States have autism (APA, 2013; Christensen et al., 2016). This statistic from the CDC prevalence study has shown a stabilization in the most recent years after increasing since the 1990s (Christensen et al., 2016). Because of the high numbers of children with ASD, families of children with ASD are in need of support and training in how to work with their child. More research needs to be completed in order to determine how best to support and educate families who have children with autism (Symon, 2005).

Social communication difficulties. Social communication difficulties is the most prominent and consistent set of symptoms that define ASD. Individuals with ASD often have

long-term social problems that first emerge when the individuals are very young. In fact, research is showing that ASD can be diagnosed before the age of two (APA, 2013; Zwaigenbaum et al., 2015). Often, social impairment is originally noticed as a language delay in toddlers (Chawarska et al., 2007). As individuals with ASD mature, social impairment can include limited nonverbal communication, a weakness in developing and maintaining relationships, and an inability to express or share their feelings with others (APA, 2013). Social impairment symptoms can vary greatly in severity and topography depending on where the individual falls on the autism spectrum and on his or her age.

Repetitive behaviors. Repetitive behaviors are the second major characteristic that distinguish ASD from other disorders. Repetitive behaviors, also called stereotypic behaviors, are generally grouped as either stereotyped behavior (STY) or self-injurious behavior (SIB) (Bodfish, 2007). Overall, repetitive behaviors are strict patterns of behavior, interests, or activities (Grahame et al., 2015). Like social impairments, an individual's repetitive behaviors are on a spectrum of severity and type (Bodfish, 2007). Depending on severity, these behavioral features of ASD can be difficult to manage and have the effect of increasing social isolation. Because of this, interventions to help children with ASD and their families have been developed.

Interventions for Individuals with ASD

Three positive behavior interventions for with children with ASD are praising, requesting eye contact, and response interruption and redirection (RIRD). These behavior interventions were chosen because they are commonly used and are simple to teach and implement. Additionally, there have been many studies showing the efficacy and positive results of using these interventions with children who have ASD.

Praise. Praise is a descriptive reinforcement or a positive verbal response to another individual's behavior. Praise has commonly been used in school and home settings to increase compliance. In fact, praise is one of the most frequently used forms of reinforcement by parents (Owen, Slep, & Heyman, 2012). Despite the prevalence of praise as reinforcement, some studies have found mixed results. For example, some studies have found a significant correlation between praise and compliance, while other studies found no relationship (Owen et al., 2012). Owen et al. (2012) suggest the key to making praise an effective part of compliance may be pairing positive attention with praise. Importantly for this study, praise, when paired with parental warmth, has been found to have a significant correlation to reducing repetitive behaviors in children with autism (Smith et al., 2008). Additionally, positive reinforcement (also a form of praise) is a basic principle within Applied Behavior Analysis (ABA), a treatment commonly used for children with autism (Granpeesheh, Tarbox, & Dixon, 2009).

Requesting eye contact. The Diagnostic and Statistical Manual of Mental Disorders (DSM-5) lists abnormalities in eye contact as an example of how a child with ASD may display deficits in nonverbal communication (APA, 2013). Poor eye contact is a common issue for individuals with autism (APA, 2013; Senju & Johnson, 2009). Because of the prevalence of this problem in children with autism, interventions have been designed to address the problem. One intervention is to use reinforcement and a child's mands (or verbal requests) in order to teach the child to make eye contact. Carbone, O'Brien, Sweeney-Kerwin, and Albert (2013) described this intervention in a case study of a child with autism. They describe an intervention in which the therapist did not respond to the child's mand unless the child made eye contact immediately prior to or simultaneously with the mand. If the child did make eye contact during or prior to the mand, the therapist delivered the reinforcement (or what the child was manding for) immediately

(Carbone et al., 2013). Therefore, a simple intervention for improving a child's eye contact is to use what the child wants as reinforcement for redirecting his or her eyes to the face of another person.

Response interruption and redirection. RIRD is a thoroughly researched intervention for repetitive behaviors and is commonly used with children who have ASD (Martinez & Betz, 2013). RIRD is conducted by stopping a repetitive behavior with a verbal prompt and then replacing the repetitive behavior with a competing one. The following steps for performing RIRD were developed from a literature review of studies evaluating RIRD (Martinez & Betz, 2013). They are

1. Parent identifies one of the child's repetitive behaviors
2. Parent gains the child's attention or eye contact
3. Parent prompts the child to do a competing activity when the repetitive behavior occurs (e.g., if the child is making noises, then the prompt will be to respond to his/her name; if the child is making repetitive actions, then the prompt will be to engage in a different activity that occupies his/her hands)
4. Parent uses a physical prompt if necessary
5. Parent praises the child for engaging in the competitive behavior

RIRD is an intervention that helps to diminish repetitive behaviors by using a second behavior to replace the child's repetitive behavior (Martinez & Betz, 2013). While information on interventions like praise, requesting eye contact, and RIRD may be easily accessed in developed countries, it may be more difficult to access behavior and health services that provide this information in developing countries (Emerson, 2007; Fujiura et al., 2005).

Poverty

The worldwide definition of poverty is often described as living on less than two US dollars per day (The World Bank, 2016; World Health Organization, 2017). Families in developing countries with higher levels of poverty may need more support. Two developing countries in southeast Europe with higher rates of poverty are Albania and the Republic of Macedonia (Macedonia) (Central Intelligence Agency [CIA], 2017).

Developing countries. More than 80% of the world's population live in developing countries. Developing countries are defined as nations without a free-market based economy (Durkin, 2002; Fujiura et al., 2005), which also face wide-ranging concerns including sanitation, disease, poor education, and inadequate health care. Developing countries also have a higher prevalence of childhood disabilities within their populations (Fujiura et al., 2005). In fact, even though children have a higher mortality rate in developing countries, the rate of developmental disabilities in developing countries is still higher than that in developed countries (Durkin, 2002). For example, reports have found that 3 out of 1000 people within developed countries have intellectual disabilities, while a parallel statistic for developing countries can range from 5 out of 1000 people in India to 20 out of 1000 people in Bangladesh (Fujiura et al., 2005). Finally, while the stress of disability within a family can be lessened through education, therapy, social programs, or medical services, these support organizations can be less established in developing countries (Emerson, 2007). This may cause families with individuals who have disabilities to miss out on help that they fervently need.

Families. Children from families in poverty have an "increased risk of academic failure, substance abuse and life altering diseases" (Corr, Santos, & Fowler, 2016, p. 1). The relationship between disabilities and poverty could cause the families who need the most help to

be the least enabled to access the resources they need. For example, according to Chasson, Harris, and Neely's (2007) study, the average yearly expense for some autism interventions can range from $20,000 to $60,000. A family who is in poverty will likely be unable to afford this large yearly expense. Families who are both in poverty and have children with disabilities are even more deeply affected by the negative impacts of poverty (Park, Turnbull, & Turnbull, 2002). The quality of life of families in poverty who have a child with disabilities is correlated with poor health (including hunger, low birth weight, and limited healthcare access), fewer life opportunities (such as the child's educational options or leisure opportunities), deprived home and neighborhood environments, lower emotional well-being (including stress, lack of flexibility, and lower self-esteem), and stressed family communication and relationships (Park et al., 2002). With the added pressure of poverty on families who also have children with disabilities, there is a significant need for affordable, effective interventions to lighten this load. Two developing countries with higher rates of poverty are Albania and Macedonia (CIA, 2017).

Albania. Albania is a developing country located in southeast Europe on the Balkan Peninsula bordering the Adriatic and Ionian Seas. Albania has a population of about 3 million, with the majority of the population identifying as ethnic Albanian (CIA, 2017). According to a census in 2013, there are 68,448 individuals with disabilities, which represents 2.5% of the population. Similarly, Radoman, Nano, and Closs (2006) estimated 2.4% of children in Albania have severe disabilities. However, Albania faces significant weaknesses in its disability assessment system and these statistics may be underestimated (Cuko, Kulla, & Kasapi, 2012; United Nations Development Programme, 2014).

Albania's unemployment rate for ages 15–24 is at 30%, while it is estimated that 17.7% of adults over 24 are unemployed (CIA, 2017). This rate is relatively high when compared to

percentages in other developed countries in Western Europe, such as 6.2% in the UK and 10.5% in France (CIA, 2017). Alongside the unemployment rate, Albania is also considered one of the poorest countries in Europe. Albania's gross domestic product (GDP) per capita is $11,900, less than a third of the European Union's GDP per capita of $37,800 (CIA, 2017; Svennebye, 2008). In these circumstances, Albanians who have children with disabilities may face additional stress as they work to provide or access enough resources for their family.

Macedonia. Macedonia is another developing country in southeast Europe on the Balkan Peninsula, sharing its western border with Albania. Macedonia has a population of 2.09 million people with the majority identifying as ethnic Macedonian or Albanian (CIA, 2017). The majority of the inhabitants of Macedonia (66%) speak Macedonian as their primary language, with the rest of the population mostly speaking Albanian. According to a survey completed by the State Statistical Office and the United Nations Children's Fund (2006), 10% of children ages 2–9 in Macedonia have a disability. Within this statistic, 8% of children in areas with higher socioeconomic status (SES) have a disability. This rate increases to 12% in areas of lower SES. The statement that poverty may be both a cause and consequence of disability supports this statistic (Fujiura et al., 2005).

Macedonia became an independent country from Yugoslavia in 1991 and is still facing economic instability. Partially because of weaknesses and irregularities with its laws, Macedonia has suffered in trade, which may have impacted local unemployment rates (CIA, 2017). The current monthly net income in Macedonia is equivalent to $405 US or 361 € (Republic of Macedonia State Statistical Office, 2016). Unemployment and low incomes have left an estimated 30.4% of Macedonians below the poverty line (CIA, 2017).

As discussed previously, families with children who have disabilities are at higher risk for being in poverty. Additionally, families with children with disabilities in developing countries are likely to lack the needed resources that would help support them. One way to help children and families receive more support is to provide training programs, which teach parents skills that will improve their ability to work with their child. One way to spread this information even further would be to then have those parents teach other caretakers of that child these newly learned skills.

Parent Training

Parent training has commonly been used with parents of children with disabilities, particularly parents of children with autism and parents of children with behavior disorders (Brookman-Frazee et al., 2006). It has been shown that through parent trainings, parents can learn to "reduce problem behaviors, respond contingently to children's appropriate behavior, improve their children's nonverbal and verbal communication skills, and increase appropriate play skills" (Symon, 2005, p. 160). Many studies have shown that parents can successfully learn interventions and then use them with their children, leading to benefits for both the family and the child (Brookman-Frazee et al., 2006; Meadan, Ostrosky, Zaghlawan, & Yu, 2009; Suppo & Floyd, 2012). For example, in Meadan et al.'s (2009) literature review of 12 parent trainings for parents with children with autism, it was found that both parents and children experienced positive side effects from participating in the parent training studies. Additionally, parent training can be an effective way to expand services for children with disabilities. It was found that involving parents in training increases the likelihood that the child will receive an intervention (Symon, 2005). Effectiveness, time spent using the intervention, and the likelihood that an intervention will be received are all benefits that show the importance of training parents

on skills for working with their children. While the importance of parent training is widely agreed on, there are many different parent training formats available (Brookman-Frazee et al., 2006; Meadan et al., 2009; Suppo & Floyd, 2012).

Kaminski, Valle, Filene, and Boyle (2008) reviewed 77 studies of parent training programs. The most common programs included curricula, modeling, homework, rehearsal, separate child instruction, and ancillary services. Similarly, in a survey of 53 parent training articles for parents of children with autism, Brookman-Frazee et al. (2006) found the same program types with the addition of coaching. According to Kaminski et al. (2008), programs that used positive interactions between the parent and child and parent skill practice had the best results. However, programs that used modeling, homework, and role playing were not linked to any significant improvements. This may be because these techniques do not involve as much parent-child interaction (Kaminski et al., 2008). Placing parents in a mentor or expert role is one aspect of parent training programs that has been shown to be beneficial to families (Ainbinder et al., 1998; Hansen et al., 2017; Symon, 2005). One effective and efficient method for passing that expert role on to the parent while also spreading information to as many people as possible is through pyramidal training programs.

Pyramidal Training

A pyramidal training model is a tiered model where non-professionals train other non-professionals on procedures. This model begins with a therapist or expert teaching an individual a procedure. That individual then teaches another individual, who then teaches another individual. In this model, each trainee, after receiving the training, becomes the trainer on a new tier. For example, the first tier in this model is the trainer training the first individual, the second tier is the first individual training a second individual, and the third tier is the second individual

training a third individual. Several studies have used this model in order to teach parents of children with disabilities a variety of skills (Kuhn et al., 2003; Loughrey et al., 2014; Neef, 1995).

Pyramidal training has primarily been used to teach new skills to three different groups of people: direct care staff (Ducharme, Williams, Cummings, Murray, & Spencer, 2001; Page, Iwata, & Reid, 1982), teachers (Pence, Peter, & Tetreault, 2012), and parents (Kuhn et al., 2003; Loughrey et al., 2014; Neef, 1995). Page et al. (1982) found that pyramidal training was effective within an institution as they trained supervisors to train direct care staff. Also, Ducharme et al. (2001) found that direct care staff learned skills well in a quasi-pyramidal training. Pence et al. (2012) found that pyramidal training can be an effective way to teach teachers, particularly when the skills being taught have concrete steps. Finally, and most importantly for this study, studies have shown that pyramidal training is an effective way to train parents and caretakers of children with disabilities (Kuhn et al., 2003; Loughrey et al., 2014; Neef, 1995).

One of the first and largest studies on pyramidal training was a pyramidal parent training program designed to compare its effectiveness to a training delivered by professionals (Neef, 1995). This study used one of the highest number of participants for pyramidal parent training: 26 parents. About half of the 26 parents were assigned to peer parent training (PPT) and the other half were assigned to standard parent training (SPT; training by a professional). The PPT group was set up in three tiers with four to five parents in each tier. Both the SPT and PPT groups had a baseline of five trials in which the parents (without feedback) taught their child a skill the way they would typically teach it. After the baseline trials had been completed, the parents were taught by a professional how to teach their selected skill to their child. Once a

mastery criterion of 85% was met, the parents were trained on how to teach this skill to someone else. Next, the parents within the first tier of the PPT group were matched with the parents in the second tier of the PPT group. Each first tier parent then taught the second tier parent the skill until the latter achieved at least 85% mastery. This process continued on throughout the tiers until all three tiers had received the training. The SPT group received the same training methods, with the exception that they received the training from the professional rather than from a peer. Neef (1995) found that peer parent training was an effective way to teach tiers of parents. Performance within the PPT group was comparable to those in the SPT group and in general, the children also made improvements in their behavior.

Pyramidal Training with Parents Teaching Other Family Members

Although pyramidal training has been shown to effectively train different groups of people, only a small body of literature has indicated that parents of children with disabilities can also train other family members (Kuhn et al., 2003; Loughrey et al., 2014; Symon, 2005). Adubato, Adams, and Budd (1981) first conducted a study on pyramidal training within a family. In this study, a mother trained her husband on teaching self-care skills to their child with developmental disabilities (Adubato et al., 1981). However, the data in this study consisted of just the two participants. Kuhn et al. (2003) next conducted a study of pyramidal training within family units. This study differed from Neef's study (1995) in that it was conducted with a smaller number of participants (3 families), it was set in the families' homes, and the first "tier" trained only one other person (another family member) rather than a group of individuals. Through a non-concurrent multiple baseline design across caregivers, Kuhn et al. (2003) was able to demonstrate that pyramidal training effectively taught skills to parents and other caregivers within all three families. However, weaknesses of this study include a small

participant number, a lack of data on long-term retention, and a delay between the implementation of the intervention and any improvement in the child's behavior (Kuhn et al., 2003). Despite these weaknesses, this study is an important addition to the literature supporting the concept that pyramidal training can be one efficient and effective way to train multiple caretakers within a family.

Loughrey et al. (2014) conducted another study demonstrating that a pyramidal approach is a potentially effective way for parents to teach other caregivers. Within this study, two caregivers were taught to use interventions at 80% or greater accuracy. Afterward, one of these caregivers, the mother, then trained her spouse on the learned procedures. A concurrent multiple baseline across modules design was used to track the learning of the three caregivers. The results showed that the first caregiver was able to train her spouse effectively, as there was an increase from 0% to 80% accuracy from baseline. This is a promising indication that caregivers can teach interventions to other caregivers (Loughrey et al., 2014). However, there was only one participant who demonstrated this, and a more thorough research base needs to be developed in order to accurately show the effectiveness of this type of intervention with families.

Symon (2005) conducted a study aimed at implementing a parent training method where the parents filled the roles of trainers or experts. In this study, three main caregivers of children with autism participated in a five-day parent education program for five hours per day. Main caregivers are caregivers who provide the largest proportion of care for a child. Significant caregivers are caregivers who provide care for a child, but that care is less than the amount the main caregiver provides. After the main caregivers participated in the education program, both a main and significant caregiver in each family sent in video clips of themselves with their child, showing if the selected significant caregiver (usually the spouse) was able to acquire the newly

learned skills from the main caregiver. However, no formal training of the significant caregivers or how to train the significant caregivers occurred. This lack of formal training is a major difference between previously described parent pyramidal training programs (Kuhn et al., 2003; Loughrey et al., 2014). Despite the lack of formal training, Symon (2005) found that the significant caregivers in each of the three families were still able to successfully learn skills taught to them by the main caregiver. Each significant caregiver improved with a baseline fidelity ranging from 0%–12% to a follow-up fidelity ranging from 76%–83% (Symon, 2005). Even without formal trainings, these significant caregivers were able to make great improvements on a skill they learned through someone else in their family. If these caregivers had received formal trainings by their same caregiver, then their acquisition of skills would likely be even greater.

Symon's (2005), Loughrey et al.'s (2014), and Kuhn et al.'s (2003) findings indicate that pyramidal parent training could be a cost-efficient and effective way to train multiple caregivers in a family who has a child with disabilities. However, all of these studies were done in similar settings where the intervention might not be needed the most, such as families from average SES within the United States. A cost-effective method of training individuals might be most useful in an area that is in need of accessible, affordable trainings, such as a developing country. If this intervention were to be expanded into developing countries, families who need the most help might be able to actually receive it. Currently, no studies have shown the effectiveness of family members training each other within Macedonia or Albania.

Method

This section will first describe the study's participants and setting of where the study took place. Next, this section will describe the procedures and measures used. Lastly, this section will address the design and analysis used.

Participants

Six participants (three married couples) participated in the study. Four of the participants were ethnic Macedonians and two were ethnic Albanians. This study was conducted within a larger study evaluating parent training. The larger study had previously received approval from the International Review Board (IRB). Participants from Macedonia were recruited through the Macedonian Scientific Society for Autism social media and email lists, and participants from Albania were recruited through an announcement sent to a short-term, inpatient facility in Albania. All participants were caregivers of a child between 4 and 12 years old with ASD. All of the children previously received a diagnosis of ASD from their pediatrician. We did not conduct autism assessments to check the diagnosis. However, the children's behaviors were consistent with behaviors typical of autism, and they engaged in behaviors the study aimed to reduce such as communication skills deficits, avoiding eye contact, and engaging in stereotypy.

The four Macedonian participants were between 40 and 43 years old. They all lived in Skopje and three of the participants were also born there. The fourth participant was born in Kavadarci, Macedonia. The two Albanian participants were 38 and 40. The participants were born in Tirana and currently lived there. The mother and father had completed up to eighth grade and the mother had limited reading skills. Since the training caregiver needed to be able to read for this study, we taught the male caregiver first, who then trained his wife on the skills he learned. In order to keep the training parallel for each couple, the male caregiver trained the

female caregiver in each session. While mothers are often the main caregivers in southeastern Europe, this choice was supported by the general patriarchy structure of the family in this area of the world (Grubera & Szohysek, 2016).

In order to participate, the caregivers' children had to have a history of avoiding eye contact and engaging in motor or vocal stereotypy, defined as repetitive motor movements or sounds that interfere with daily life. Each participant also needed to be willing to attend a training session for one day. Participants received an incentive of $20 US for participating in this study. The participants requested that the incentive be in United States dollars rather than the local currency. The small participant number of six participants is enough to contribute to evidence-based practice according to the Institute of Education Sciences' standards (Kratochwill et al., 2010).

Setting

Countries. This study was set in both the Republic of Macedonia and Albania, two developing countries in southeast Europe. Macedonia and Albania are located on the Balkan Peninsula with Macedonia sharing its western border with Albania. Albania and Macedonia have between 14.0% and 30.4% of the population living below the poverty line (CIA, 2017).

Training rooms. The trainings were completed in two different settings. In Macedonia, the trainings were conducted within a hotel conference room in the capital city of Skopje. The training room was about 1,500 square feet and was located in the hotel basement. This study was conducted within a larger study evaluating parent training in Macedonia. Each training session consisted of two caregivers, a therapist, a coder, and a videographer. The participant's children did not participate in the training. The coders and videographers were students from Brigham Young University. The coder's responsibility was to fill out the training acquisition

sheet and the videographer filmed the session with an iPad. The therapists were students studying behavioral science at the Institute of Special Education and Rehabilitation in Skopje. There were also two professors, other participants, participant's children, and two other Brigham Young University students present at the training sessions.

In Albania, the training was conducted in Albania's capital, Tirana. Trainings occurred in a therapy room located within a short-term, inpatient facility for children with neurodevelopmental disorders and their mothers. The room was approximately 100 square feet. The training session in Albania had fewer people in the room than the training session in Macedonia. The session consisted of two caregivers and a therapist who spoke Albanian fluently. Other individuals in the room included a professor from Brigham Young University and a videographer. The therapist and videographer were students from Brigham Young University. Blake Hansen, a professor at Brigham Young University who is fluent in Albanian, coded these sessions afterward.

Intervention Procedures

The parents learned three skills: requesting eye contact, using praise, and redirecting repetitive behaviors. Each session was approximately 10 minutes and consisted of five people: a therapist, a coder, a videographer, the first (male) caregiver (C1), and the second (female) caregiver (C2). As shown in Figure 1, each session occurred in this sequence: first, C1 was given a baseline simulation or pretest by the therapist for all three skills. The coder tracked C1's behavior on the task analysis form. After C1 received their baseline simulation, the therapist gave C2 the same baseline simulation for all three skills. The coder also tracked C2's behavior on the task analysis form. Next, the therapist trained C1 on all three skills using the training script and task analysis form. While the therapist trained C1 on the skills, the coder filled out the

training piece of the task analysis form. After C1 was trained, the therapist stepped back. During this phase, C1 took the training role by using the training script provided. C1 then trained C2 on all three skills. The coder tracked their behavior on the task analysis form. After C1 trained C2, C1 received a follow-up simulation administered by the therapist. Following C1's simulation, C2 was given an identical follow-up simulation or posttest by the therapist. The coder recorded behavior for both caregivers on the task analysis form.

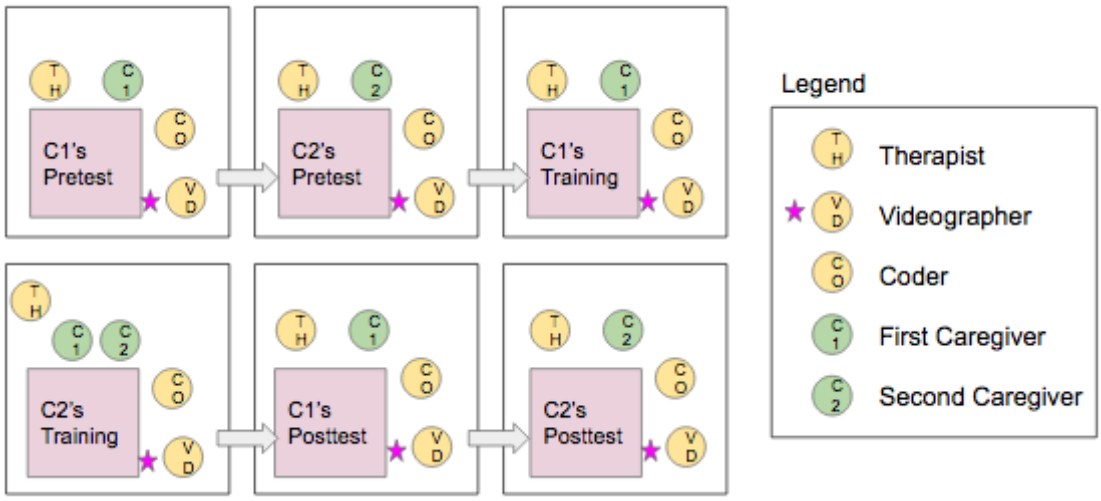

Figure 1. Phases of a pyramidal training with two caregivers.

Measures

Task analysis form. Parents' behaviors were directly observed during three different time points throughout each session and evaluated with a task analysis form. The three different time points were a simulation before training (pretest), a performance during training (training), and Phase 3, a simulation after training (posttest). The caregivers were evaluated on their completion and quality of the steps for each skill. A task analysis measured the caregivers' completion of the steps and a five-point Likert scale measured the caregiver's quality of each step. The pretest, training, and posttest sections all had similar steps for each skill. Parents were allowed prompts during the training time point, but were not allowed prompts during the pretest

and posttest time points.

The pretest and posttest time points on the task analysis form measured C1's and C2's acquisition and the therapist or C1's implementation fidelity of the simulation for each of the three skills: Praising Compliance, Eliciting Eye Contact, and Response Interruption/Redirection. The task analysis form measures the caregivers' acquisition by listing the steps needed to complete each skill and then provides a space for the five-point Likert scale quality rating. For example, the first step of the skill "praise" is to "look at you." After the caregiver did this, they received a + and then a quality rating of how well they demonstrated that step. This is repeated for each step for each skill under pretest. The steps for the skill "praise" are participant looks at trainer, praise was contingent upon compliance, participant gave an opportunity for compliance, participant said a positive statement, participant had an enthusiastic tone of voice, and participant had a pleasant facial expression.

After evaluating the caregivers' acquisition, the therapist completed an implementation fidelity checklist. Implementation fidelity is a measure of the extent to which the therapist or C1 implemented the interventions as they were designed. For example, steps under the skill Praising Compliance for Fidelity include "scenario presented to participant" and "participant attentive." The therapist would then mark whether these steps were completed with a plus or minus sign and then rate the quality of each completed on the five-point Likert scale. Each skill is split into two categories, steps and quality. Steps is the number of steps for each skill the participant completed (with a total of 6 steps per skill possible). Interobserver agreement was measured for at least 50% of these data. While the simulation steps varied for each skill, the implementation fidelity checklist remained the same. The posttest section of the Task Analysis Form contains the same steps and procedures except that this part of the form is used to evaluate the parent's

knowledge after training rather than before.

Under the training time point, the task analysis form measured the trainer's implementation fidelity and the parent's acquisition of the three skills. The training section of the task analysis form is set up the same as the pretest and posttest sections. Similar to the pretest and posttest sections, the training section still contains a task analysis completed with either a + or - and a quality rating on a five-point Likert scale for each step. The main difference in the training section compared to the pretest and posttest sections of the Task Analysis Form is that the parent's acquisition of each skill is being measured rather than the simulation of each skill. While the steps for each skill are similar, the parents had the opportunity to learn the steps while using a handout rather than being tested on their knowledge without help or prompts.

Simulations. Simulations were three minutes each and occurred before and after training sessions in order to create baseline and follow-up data points. Each participant went through three baseline simulations, three trainings, and three post simulations (one for each of the three skills). A simulation occurred for each skill: Praising Compliance, Eliciting Eye Contact, and Response Interruption/Redirection. Each simulation followed a similar structure:

1. Parents were told to role play a scenario and to act as if they normally would with their child with ASD.
2. The trainer presented the scenario to the trainee.
3. Parents responded within the scenario as if the trainer was their child.
4. All data were recorded.

Parent behaviors were measured by steps completed and a quality rating scale with the task analysis form. After each of the steps were completed, the simulation session ended.

Trainings. Trainings were three minutes each and followed the baseline simulations. Trainings occurred for each of the three skills, one after another. Each training followed a similar structure. First, trainers read a definition and rationale to parents. This explained to the parents the skill they would be learning and how it could positively affect their child. Then, trainers then went through each step required for that specific skill. For example, the training script for the skill Response Interruption/Redirection requires the parents to (a) identify repetitive behaviors and a competing behavior, (b) gain the child's attention, (c) direct the child to a competing behavior, and (d) praise competing behavior. After parents were directed through each step, they participated in guided practice. This step continued until the parent was able to perform each step without prompts. Steps completed and a quality rating scale with the task analysis form measured parent acquisition. After all of these training steps were completed, the parent trainings ended.

Demographics questionnaire. Participants in both Macedonia and Albania were asked to complete a demographics questionnaire prior to participating in the study. The questionnaire contained questions asking about parents' date of birth, city of birth, and ethnicity. Additionally, there were questions about their child and their child's disability. For example, the parents were asked to describe their child's disability, challenging behaviors, and strengths. Therapists who spoke the participant's native language were available to answer any questions about this questionnaire.

Observation. Each simulation and training was videotaped. Parents' performance of skills, implementation fidelity within each simulation, training fidelity, and parent's acquisition of skills within the parent training sessions were all observed. These data were recorded through the task analysis form by the coder. An additional trained observer coded 81% of the videos in order to ensure interobserver agreement reached at least 50%.

Interobserver agreement. To measure interobserver agreement, a second trained observer coded 81% of the data by watching the session videos recorded on the iPads and recoding the sessions. The agreement percentage of the two coders' results was then calculated by taking the number of agreements for steps completed and quality ratings (plus or minus one) for each participant and then dividing it by the total number of agreements possible for each participants' pretest, training and posttest (Cooper, Heron, & Heward, 2007). The agreement percentage for steps completed and quality of the two coders' results was 82%.

Social validity. Wolf (1978) defined social validity with three parts. Social validity is whether a treatment's end goals are actually desired by society, if the methods used in the treatment are worth the end goals, and if the actual consequences of the treatment are desired (Wolf, 1978). The most common measures of social validity are participant ratings or statements and normative comparison (comparing the participant's behavior before and after an intervention) (Kennedy, 1992). Another less common way to measure social validity is through participant comments. While a more informal measure of social validity, the Social Validity Manual lists consumer comments, informal discussions, and interviews all as general methods for assessing social validity (Carter, 2010). Additionally, Hurley's (2012) literature review of 90 social competence intervention studies listed anecdotal conversations as a social validity

assessment used by a few studies to confirm the acceptability of an intervention.

Social validity was measured through coding participant comments about the training. Participants' comments were originally made in their native language (either Macedonian or Albanian). Following the trainings, the videotapes of each participant's training were transcribed by individuals fluent in that language. After analyzing the transcript for each participant, comments relating to the trainings were coded as a comment of "social significance of the goals," "social appropriateness of the procedures," and/or a "connection to their life." These categories were based off of Wolf's (1978) definition of social validity as whether a treatment's end goals are desired ("social significance of the goals" and "connection to their life") and if the methods used are worth the end goals ("social appropriateness of the procedures"). The comments coded as a comment of "social significance of the goals" or "social appropriateness of the procedures" were coded as either receptive or unreceptive based on if the participant's comment was receptive or unreceptive of the goals or procedures. Percentages for receptive and unreceptive comments within each social validity category ("social significance of goals" and "social appropriateness of the procedures") were then calculated.

Design and Analysis

A repeated acquisition design across three variables was used to evaluate the effectiveness of the intervention with the goal to observe level changes from the pre- to post-simulation (See Figure 1). In this design, the data were collected over three data points on all six participants. Baseline data was first gathered with each participant. Following the baseline simulation, training data were collected for the participants and then finally follow-up simulation data were collected. This process continued until all six participants received the intervention. This design analysis meets the Institute of Educations Sciences' standards with reservations

because it did not meet the minimum threshold of five baseline data points (Kratochwill et al., 2010). The present study will use visual analysis of level, trend, variability, and phase change consistency to identify effectiveness of the intervention.

Results

This section will address the three research questions for this study and the results answering each question. The section will first address the questions, "Can a caregiver train another caregiver?" and "Can each caregiver acquire the three skills?" by examining each participant's acquisition of the skills taught. This section will also look at training fidelity in order to further answer the question "Can a caregiver train another caregiver?" Lastly, this section will address the question "Were the caregivers receptive to this training model?" by examining the comments made by the participants.

Acquisition of Skills by Participants

The first research question of this study is "After being trained by a professional, can a caregiver train another caregiver to appropriately redirect repetitive behaviors, use praise, and request eye contact?" and the second research question of this study is "Can each of the caregivers acquire the three skills?" Both of these questions focus on the acquisition of the three skills of each of the participants. Table 1 shows the acquisition progress made by each of the six participants in all three of these skills. Each skill is split into two categories, steps and quality. Steps is the number of steps for each skill the participant completed (with a total of 6 steps per skill possible). Quality is the rating for each step the participant completed (with each step being rated on a scale of 0-5).

Table 1

Participants' Percent of Growth from Pretest to Posttest in Steps and Quality

Participant	Praise Steps	Praise Quality	Eye Contact Steps	Eye Contact Quality	RIRD[a] Steps	RIRD Quality
M2	0.00%	16.67%	0.00%	20.00%	16.67%	33.33%
M3	0.00%	0.00%	16.67%	6.67%	33.33%	30.00%
W5	50.00%	70.00%	33.33%	66.67%	50.00%	70.00%
W6	0.00%	20.00%	33.33%	36.67%	33.33%	63.33%
A1	100.00%	100.00%	100.00%	100.00%	83.33%	83.33%
A2	0.00%	0.00%	50.00%	36.67%	66.67%	60.00%
Average	25.00%	34.45%	38.89%	44.45%	47.22%	56.67%

Note. [a] RIRD stands for Response Interruption and Redirection.

Within each skill, almost all the participants either progressed in the number of steps of a skill completed or the overall quality of each step performed. However, participants M3 and A2 actually completed 100% of the steps for praise with a 100% quality rating in both their pre- and posttests. This made it so that participant W6 and A2 showed 0% progress in both steps completed and quality rating for the skill praise, as they had already reached 100% prior to intervention. M2 and M3 had errors with their training fidelity and did not have an opportunity to receive guided or independent practice. Because of this, their acquisition scores for training are not reported. A more detailed description for the progress of each skill will follow.

Praise. For praise, all participants could perform the skill with 100% fidelity at posttest. This means that each participant was able to perform all 6 steps with a quality score of 30 by posttest. M2 completed 6 out of the 6 steps at pretest and posttest. While M2 did not progress in steps completed, he did improve in his quality scores for praise. M2's quality score improved from 25 in the pretest to 30 (the highest score) in the posttest. M3 did not show progress in

either steps completed or quality because M3 started off with 100% acquisition at pretest. M3 completed 6 steps at pretest and posttest. M3 also received a quality score of 30 at pretest and at posttest. W5 improved in both steps and quality for the skill praise. W5 completed 3 out of 6 steps at pretest, 6 out of 6 steps at training, and 6 out of 6 steps at posttest. For quality, W5 scored a 9 at pretest, a 30 at training, and a 30 at posttest. W6 improved in quality for the skill praise while steps completed remained at 100% fidelity. W6 completed 6 out of 6 steps for all three time points. For quality, W6 received a score of 24 at pretest, 30 at training, and 30 at posttest. A1 improved from a 0 in steps and quality to a 6 in steps and a 30 in quality for the skill praise. A1 completed 0 out of 6 steps at pretest, 6 out of 6 steps at training, and 6 out of 6 steps at posttest. For quality, A1 received a score of 0 at pretest, 30 at training, and 30 at posttest. While A1 had a dramatic improvement, A2 did well at all time points. For steps completed, A2 received a score of 6 at all three time points. For quality, A2 received a score of 30 for pretest, training, and posttest. Figure 2 shows participants' acquisition of the skill praise across the pretest, training, and posttest time points.

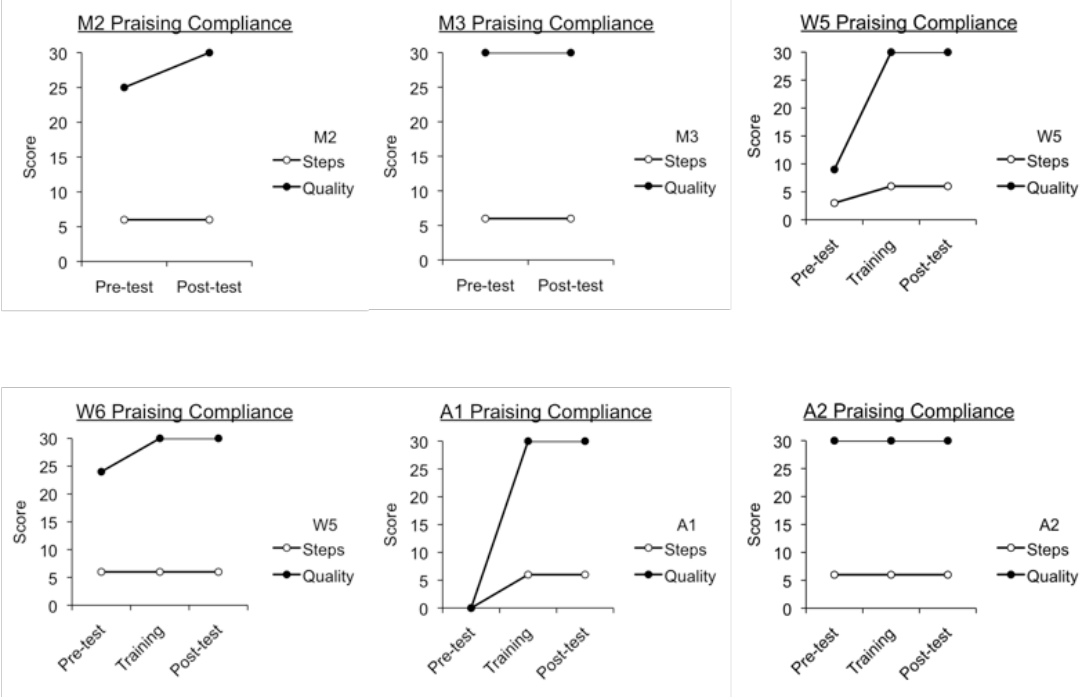

Figure 2. Participants' praise acquisition during the pretest, training, and posttest.

Eye contact. By posttest, all of the participants could perform the 6 steps for this skill. However, the quality scores for the participants ranged from 27 to 30. Compared to their pretest, all participants progressed in either steps completed or quality, but several participants dipped in their scores at training before returning to a higher score at posttest. M2 completed 6 out of the 6 steps at pretest and 6 out of 6 at posttest. M2's quality score for eye contact improved from 24 in the pretest to 30 in the posttest. M3 improved in both steps completed and quality. M3 completed 5 out of 6 steps at pretest and 6 at posttest. For quality, M3 scored a 25 at pretest and a 27 at posttest. W5 also improved in both steps and quality for the skill eye contact. W5 completed 4 out of 6 steps at pretest, 6 out of 6 steps at training, and 6 out of 6 steps at posttest. For quality, W5 scored a 10 at pretest, a 27 at training, and a 30 at posttest. When comparing pretest to posttest, W6 improved in both steps completed and quality. W6 first completed 4 out of 6 steps at pretest and then 6 at training and posttest. For quality, W6 scored a 17 at pretest, 30

at training, and 28 at posttest. W6 scored 2 points lower on the posttest for quality than he had during training. However, this score was still higher than his initial pretest score of 17, showing improvement. A1 and A2 improved significantly in eliciting eye contact from pre to posttest. A1 completed 0 out of 6 steps at pretest but improved to completing 6 out of 6 steps at training and posttest. A1 also scored a 0 out of 30 on quality for the pretest but improved to a 30 during the training and posttest. A2 completed 0 out of 6 steps at pretest, 6 at training, and 3 at posttest. A2 scored a 0 on quality for the pretest, a 30 at training, and 11 at posttest. Because these posttest scores were so low, A1 was retrained by the therapist and received a second posttest. On the second posttest for eliciting eye contact, A1 completed 6 out of 6 steps and received a quality score of 30. Figure 3 shows participants' acquisition of the skill requesting eye contact across the pretest, training, and posttest time points.

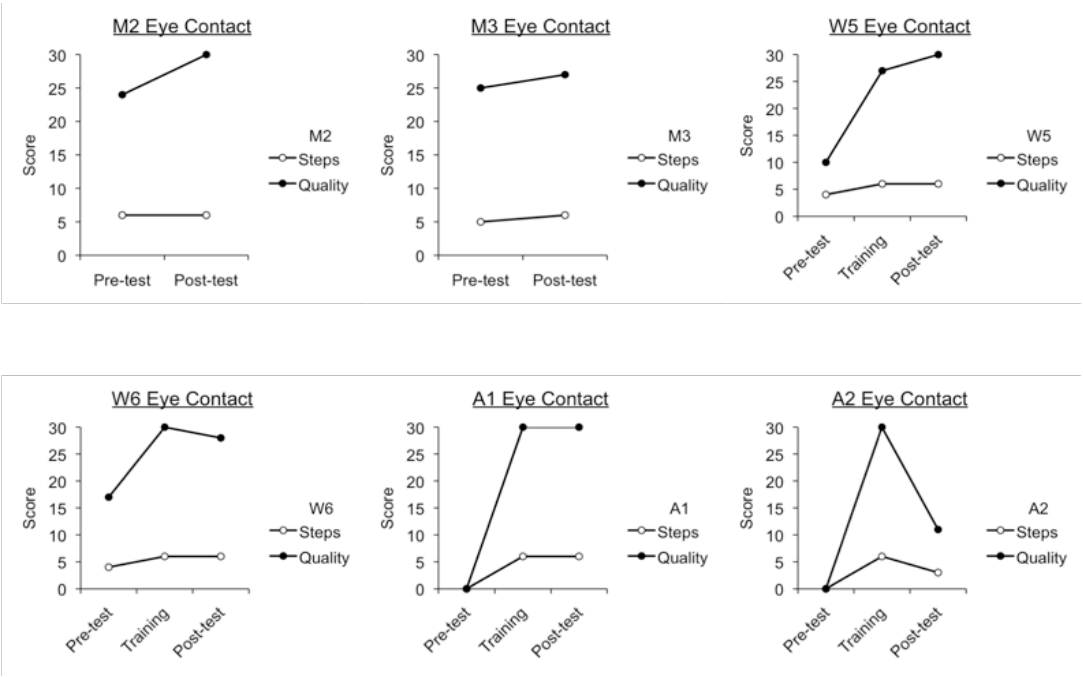

Figure 3. Participants' requesting eye contact acquisition during the pretest, training, and posttest.

Response interruption and redirection. All participants improved in both steps completed and quality for the skill RIRD. M2 performed 4 steps of RIRD at pretest and 5 at posttest. For quality, M2 scored a 16 at pretest and 26 at posttest. M3 completed 3 out of 6 steps at pretest and 6 at posttest. For quality, M3 scored a 15 at pretest and a 24 at posttest. W5 improved in both steps and quality. W5 completed 3 out of 6 steps at pretest, 6 at training and 6 at posttest. For quality, W5 scored a 9 at pretest, a 28 at training, and a 30 at posttest. W6 improved in steps completed and quality. W6 first completed 4 out of 6 steps at pretest and then 6 at training and posttest. For quality, W6 scored an 11 at pretest, 30 at training, and 30 at posttest. A1 improved in steps completed and quality. A1 completed 0 out of 6 steps at pretest, 6 at training, and 5 at posttest. A1 received a quality score of 0 at pretest but improved to 30 during the training and 25 at posttest. A2 also improved in steps completed and quality. A2 completed 0 out of 6 steps at pretest, 6 at training, and 4 at posttest. A2 received a quality score of 0 at pretest, 26 at training, and 18 at posttest. Because these lower posttest scores, A2 was retrained by the therapist and received a second posttest. On the second posttest for RIRD, A2 completed 6 out of 6 steps and received a quality score of 30. Figure 4 shows participants' acquisition of the skill RIRD across the pretest, training, and posttest time points.

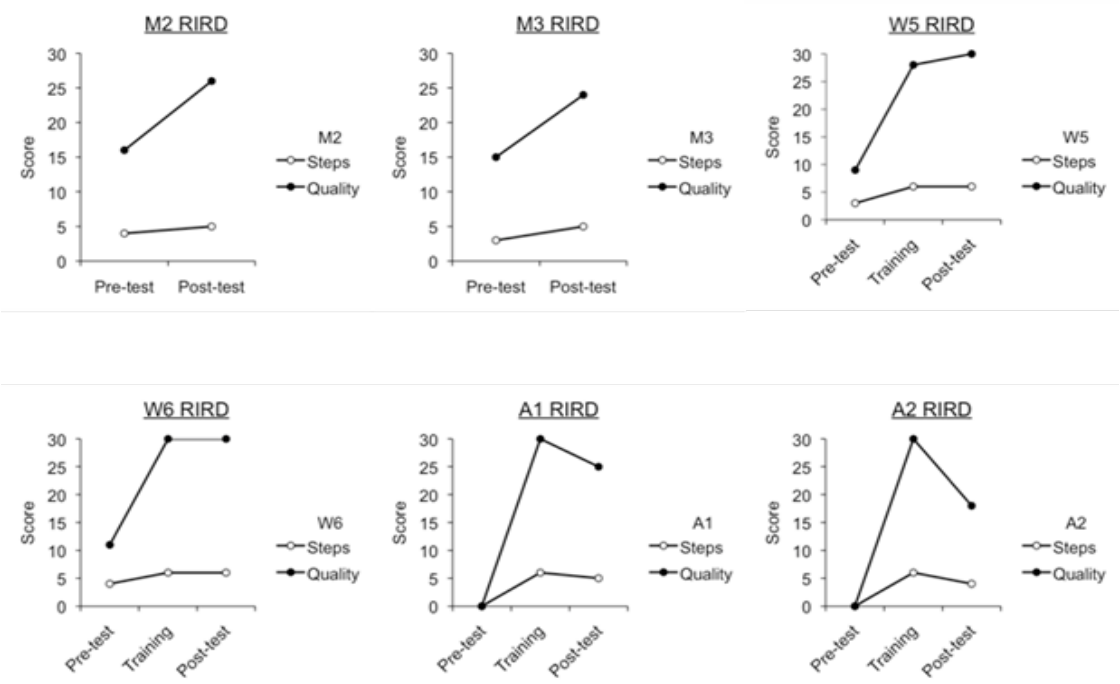

Figure 4. Participants' RIRD acquisition during the pretest, training, and posttest.

Training Fidelity

Another part of the first research question is whether or not the participants were able to train the other participants, or caregivers, on the three skills. This was measured by the completion of 6 steps and a quality measure out of 30 (a rating of 0-5 for each step). Out of the three participants training another participant (W5, M2, and A1), two had a 90% or higher training fidelity. A more detailed description of the training fidelity for the caregivers who trained another caregiver will follow. Training fidelity is summarized in Table 2.

Table 2

Participants' Percent of Training Fidelity

Participant	Praise Steps	Praise Quality	Eye Contact Steps	Eye Contact Quality	RIRD Steps	RIRD Quality
W5	100.00%	93.33%	100.00%	93.33%	100.00%	93.33%
W6	100.00%	90.00%	100.00%	100.00%	100.00%	93.33%
M2	50.00%	53.33%	33.33%	46.67%	50.00%	53.33%
M3	66.67%	66.67%	66.67%	66.67%	33.33%	40.00%
A1	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
A2	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
Average	86.11%	83.89%	83.33%	84.45%	80.56%	80.00%

Note. [a]RIRD stands for Response Interruption and Redirection

Participant W5. When W5 trained W6, he had the second highest training fidelity of all the participants. W5 completed the training steps for praise, eye contact, and RIRD at 100% fidelity. W5 was also rated with a training quality score of 27 out of 30 for praise, 30 out of 30 for eye contact, and 28 out of 30 for RIRD. The praise and RIRD training quality scores were both lower for "modeled skill." The training W5 received and the training W5 gave to W6 had similar levels of training fidelity. W5 was trained at 100% fidelity for the steps for all of the skills and the quality was rated 28 out of 30 for each skill.

Participant M2. M2 trained M3 with lower training fidelity than the other two training caregivers. M2 completed 4 out of the 6 training steps for praise, 4 out of the 6 steps for eye contact, and 2 out of the 6 steps for RIRD. M2 was rated with a training fidelity quality score of 20 out of 30 for praise, 20 out of 30 for eye contact, and 12 out of 30 for RIRD. M2's training fidelity was marked down for praise and eye contact because he did not provide M3 with guided or independent practice. M2's training fidelity was marked down for the skill RIRD because M2

did not read the steps of how to perform RIRD to M3, M2 did not model the skill, and M2 did not provide guided or independent practice. It was noted that M2's trainer had low training fidelity. M2's trainer did not model or allow time for practice, affecting M2's training performance later. For example, the training fidelity for the training M2 received had similar levels of training fidelity as the training he gave to M3. M2's trainer completed 3 out of the 6 training steps for praise, 2 out of the 6 steps for eye contact, and 3 out of the 6 steps for RIRD. Additionally, M2's trainer was rated with a training quality of 16 out of 30 for praise, 14 out of 30 for eye contact, and 16 out of 30 for RIRD.

Participant A1. A1 trained A2 with the highest training fidelity of all the participants. A1 completed the training steps for praise, eye contact, and RIRD at 100% fidelity. A1 was also rated with a training quality score of 30 out of 30 for praise, eye contact, and RIRD. The training A1 received and the training A1 gave to A2 had similar levels of training fidelity. A1 was trained at 100% fidelity for the steps and quality for all of the skills.

Social Validity

Out of all the comments the six participants made, 16 of the comments were related to social validity as defined by Wolf (1978). Comments relating to the "social significance of the goals" and "social appropriateness of the procedures" were all coded and then distinguished as receptive or unreceptive comments. Comments connecting the training to the client's own life were also coded. Of the 16 comments made, 9 of the comments were coded as relating to the "social significance of the goals" and 7 of the comments were coded as relating to the "social appropriateness of the procedures." Participants also made a total of 10 comments relating the training to their own life. Six of these comments were made in addition to the 16 social validity comments while 4 of these comments were also coded as "social significance of the goals" or

"social appropriateness of the procedures." The majority of the comments relating to the "social significance of the goals" were positive or receptive. Six of the 9 comments relating to the "social significance of the goals" were receptive (66.67%) and three were unreceptive (33.33%). While the majority of the comments relating to the goals were positive, the majority of the comments relating to the "social appropriateness of the procedures" were unreceptive of the procedures. Three of the 7 comments relating to the procedures were receptive (42.86%), while 4 of the comments were unreceptive (57.14%). Examples of participants' comments are included in Table 3 and Table 4.

Table 3

Participants' Comments Making a Connection to Their Life

M2: "Oh, totally, but sometimes I'll tell my kid, 'Hey, look at me over here!' and he'll just look at the book, not at me."
M2: "Yeah, we find that like a soccer ball works out really well. Any kind of ball, really."
M3: "Sometimes I can get him to take things like that but it's really hard."
W5: "I've found really that showing him how things work captures his attention often enough."
A1: "There are times for example, that she's focused for two or three hours and has, how to say, an obsession."
A1: "There are times, for example, when it comes to eating that she says no and puts her fingers in her mouth. She won't eat meals and says no. There are instances where she has an obsession and she wants it without discussion. For example, she wants this or that object and it's not up for discussion. There are instances where she does that."

Table 4

Participants' Comments Indicating Social Validity

Social Validity	Receptive Comments	Unreceptive Comments
Social significance of the goals	M2: "Ok, good. That totally makes sense. That's what I tend to do with my own child, so it only makes sense." M2: "Yeah, the thing is, whenever my kid does something repetitive it's really important to make his mind work on something else and point him to other things going on." M2: "Yeah, I agree. Having something to hand is important." M2: "No, I'm serious. Between men and women, looking each other in the eye and praising one another is a really good thing!" M3: "Man, you could make people stand, sit down, etc." W6: "Thanks! Now I can actually get back to doing this with my child for real."	W5: "Yeah, he really doesn't bang his hands like that I don't think." A2: "I haven't experienced this." A2: "Yes, I haven't experienced this."
Social appropriate-ness of procedures	M2: "This is good. They know what they are talking about" W6: "Is it okay for me to take all these papers home?" A1: "Yes, it's very understandable."	M3: "Oh I get it! It's strange for me, it really is!" M3: "You're great. I mean, with them it was a little confusing and sounded kind of dumb." M3: "That was really weird for me…" W6: "This feels a little strange, huh?"

Discussion

The purpose of this study was to determine if a caregiver of a child with ASD could effectively train another caregiver on behavior interventions they had been taught. It was hypothesized caregivers would effectively train another caregiver on three skills for working with their child with ASD; the caregivers would learn the three skills; and the majority of the comments made by the caregivers would be receptive of the goals and procedures of the study. The purpose of this study was accomplished and caregivers were able to train another caregiver and learn three skills for working with their child with ASD. While it was hypothesized the majority of the unprompted comments made by the caregivers would be receptive of the goals and procedures of the study, only the majority of the comments made about the goals of the study were receptive. These findings suggest that pyramidal training among caregivers is an effective and low-cost method for teaching skills to different caregivers of a child with ASD but the procedures of pyramidal training should be adapted according to the needs of the individuals participating.

Several studies have shown promising indications that caregivers can effectively teach interventions to other caregivers of the same child (Kuhn et al., 2003; Loughrey et al., 2014; Symon, 2005). However, these studies were all conducted in the United States of America where citizens often have access to more resources (Emerson, 2007; Hansen et al., 2017). This study adds to this body of research by showing that after being trained by a professional, a caregiver can train another caregiver to appropriately redirect repetitive behaviors, use praise, and request eye contact in the setting of a developing country. Of the three participants who trained another caregiver, only one trained below 90% fidelity. There was a breakdown in the training system among the Macedonian participants M2 and M3. M2 and M3 received modeling

but did not receive guided or independent practice. This breakdown in the pyramidal training likely occurred because of low training fidelity. M2's trainer did not train M2 correctly; M2 did not receive guided or independent practice when he received his training, which affected the training he gave to M3. Overall, participants who were trained at 90% fidelity or more for both steps and quality were able to then train others at this same 90% fidelity of steps and quality. However, participants who were trained at a lower fidelity percentage then trained others at a lower fidelity percentage. This suggests that it is important to correct for training drift and for the initial training of the first caregiver to include all training components in order for the pyramidal training structure to be successful.

This study also suggests caregivers can acquire skills for working with their child with ASD through a pyramidal structure. Despite the gap in training fidelity, each caregiver made improvements in steps and quality for the skills unless they began the pretest with high acquisition. This means all three training caregivers were able to train another caregiver despite M2 not providing guided or independent practice for M3. However, the participants who received guided and independent practice did make greater gains in acquisition of steps (Mean of Steps Improved = 3) and quality (Mean of Quality Improved = 17.67) on average than the participants who did not receive guided and independent practice (Mean of Steps Improved = .67; Mean of Quality Improved = 5.33). This research is important for the literature on pyramidal training because it contributes another study to the limited studies of caregivers training other caregivers on behavior interventions (Kuhn et al., 2003; Loughrey et al., 2014; Symon, 2005). Additionally, it extends the research into a developing country where affordable access to information could be very valuable to families (Kuhn et al., 2003; Loughrey et al., 2014; Symon, 2005).

The third research question of this study was, "To what extent were the caregivers receptive to this training model based on their unprompted comments about the training?" The results suggest the caregivers were generally receptive to the goals of the study, but there was a conflict with the social appropriateness of the procedures. Of the nine comments made about the social appropriateness of the goals, six were receptive and three were unreceptive. All three of the unreceptive comments were made because the participant did not think their child experienced the behaviors the behavior technique was helping with. For example, participant A2 said two times, "I haven't experienced this" during the posttest of RIRD. While the participant's child did experience stereotypic behavior (biting her hand), she did not experience the behavior of hand flapping, which was the behavior used in the RIRD training and simulations. This suggests that the social validity of pyramidal training could be further improved by changing the training and simulations to be specific to the problems the individual is dealing with in their life. For example, in this study, participant A2 may have been more receptive of the goals of the study if the simulation and training used hand biting as the example rather than hand flapping. Despite these comments that were not receptive of the goals of this study, there were many comments approving the goals of the study and several participants expressed excitement about what they were learning, such as, "Now I can actually get back to doing this with my child for real." While the social appropriateness of the goals may be improved based on the participant's experience, the results indicate this intervention's goals were desired.

Of the seven comments made on the social appropriateness of the procedures, three were receptive and four were unreceptive. Of the unreceptive comments, three commented the pyramidal training was "strange" or "weird" and one participant commented the pyramidal training was "confusing and sounded kind of dumb." These results suggest the organization of

pyramidal training should be explained more extensively before beginning the intervention. It also suggests that increased sensitivity to participants' background, culture, and education style should be made in order to improve the social appropriateness of the procedures. It would also be helpful to consider pairing this measure of social validity with a second measure, such as an interview or survey, in order to gather more information on the participant's views. While further research can be made into studying the social appropriateness of the procedures of pyramidal training, several participants' comments did approve of the procedures, for example, "Is it okay for me to take all these papers home" and "Yes, it is very understandable."

This research on social validity is especially important to the literature of pyramidal training among caregivers because current studies do not contain measures of social validity (Kuhn et al., 2003; Loughrey et al., 2014; Neef, 1995; Symon, 2005). This study adds to the literature by providing a measure of social validity to an area where there has been little consideration for social validity. It is important to note not all of the participants made comments about the social appropriateness of the goals or procedures and some of the participants may have responded if asked. Therefore, these results should be interpreted with caution. Additionally, further research should be done on the social validity of pyramidal training with parents in order to better understand the social acceptance of its goals and procedures.

Limitations

A limitation of this study was the short length of data collection. There were time constraints to collect the data efficiently because the study was being conducted internationally. This resulted in less baseline data points than the recommended five (Kratochwill et al., 2010). Since the length of the study was limited, it is difficult to hypothesize the parents' retention of

these skills after only one training session. There may also be some variability in the parents' acquisition of the skills or training ability depending on stress or the time of the day. Future studies should collect data over longer periods of time in order to understand the long-term results.

The study had a small sample size (n = 6). This makes it difficult to generalize the findings across cultures or to larger populations. While caution should be used before generalizing the results to other groups of people, this study does provide preparatory information for more research to be conducted on caregivers using pyramidal training in developing countries.

This study demonstrated caregivers can be trained on skills and can then train other caregivers on those skills. However, we do not have direct observations of the parents implementing the skills in their homes. This limits knowledge of the retention and social validity of the intervention. Future studies should collect data in a more natural environment and, if possible, track how often the caregivers use these skills on their own.

Another limitation was that the ASD diagnosis for the children of the participants was not verified, limiting the generalizability of the study. There are differences in diagnostic procedures between Eastern Europe and the United States of America. Therefore, best practice would have been to conduct a second, confirming diagnosis for each participant's child with ASD. Despite not verifying each diagnosis, a prerequisite for participation was the participant's child needed to engage in stereotypic behaviors.

Implications for Practice

A training system similar to the one described in this study would be useful to a variety of professionals working with families in both developing and developed countries. While this

system may be most useful in a country where there is a greater need for affordable training, it is an efficient method for training caregivers and would also be useful in developed countries. However, one consideration to make for families in developing countries is that behavioral services may not be a priority for families who are struggling to meet their basic needs such as health care, shelter, or food. Despite this, pyramidal training would still be useful to many families who want and are not able to access needed information. Professionals such as doctors, social workers, or behavioral therapists could use pyramidal training to pass information on through the family in order to benefit children with disabilities and their families.

School psychologists in the United States are another group of professionals who would benefit from using a pyramidal training system among caregivers. The National Association of School Psychologists lists parent training and strategies to promote social-emotional functioning as practices school psychologists provide in order to meet the needs of their school. Given that individuals with ASD comprise about 1% of the population, school psychologists are likely to work with this population and their caregivers (APA, 2013). Access to a cost-efficient system of training parents on skills for working with their children with ASD would be beneficial to school psychologists. Not only would they save time by training multiple people quickly, but they could provide important information to families who often need more support.

Conclusion

This study added to the research base of pyramidal training as an intervention for families of children with ASD. The results of this study suggest that within a developing country, caregivers can train another family member on behavior strategies for working with their child with ASD, caregivers being trained can learn behavior skills from other caregivers, and caregivers find the training goals of pyramidal training acceptable. These findings suggest

pyramidal training may be an effective and affordable intervention for caregivers of children with ASD living in developing countries.

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APPENDIX A: Training Protocols

Verbal Praise for Compliance

When training, read the *italicized* words aloud.

Definition and Rationale
Noncompliance (not following directions) is among the most common problem behaviors in children with disabilities. The first skill we are going to learn is verbal praise for following directions. Verbal praise is when an adult says a positive comment after a child does something well. Verbal praise is important because it helps children learn. Praise is based on a principle called "positive reinforcement." Positive reinforcement is a consequence that increases a behavior. Therefore, if you want a child to do something more often, praise the behavior you want to see more often.

Step 1 – Determine which Behaviors to Praise
The first step is to determine which behaviors you are going to praise. The behaviors can be anything including behaviors such as eye contact and following directions. Verbal praise is useful for many behaviors.

Step 2 – Steps for Providing Praise

When your child does the behavior you want to praise:

1. *Look at your child.*
2. *Smile or have a pleasant look on your face.*
3. *Using an enthusiastic tone of voice, say a positive word (such as good job! Nice work!). You may also say what the child did well (for example, nice work! I like how you cleaned up your toys!)*
4. *Vary the words you use to praise. For example, say different words each time you praise, rather than saying "good job!" each time.*
5. *Praise frequently.*

Let's practice.

Step 3 - Practice

- Place the toy on the floor. Say, *tell me to pick up this item.* After I pick up the item, use a verbal praise.
- Parent should tell you to pick up the item, but if they don't prompt them to do so.
- Pick up the item.
- Once you pick up the item, the parent should offer praise. If they don't, prompt them to do so by saying, *praise me for doing so*.

Parents have completed training when they demonstrate praise by:

1. Looking at you
2. Saying what you did well
3. Using a nice voice
4. Having a smile or pleasant look on their face

Prompting Eye Contact When Children Request

Definition and Rationale
The second skill we are going to learn is prompting eye contact. Even though eye contact is important for social interactions, many children with disabilities have difficulty giving eye contact. Therefore, it is important to teach children with disabilities to provide eye contact.

Step 1 – Find something that the child can request
The first step is to determine an item motivates the child that he/she can request with words, pictures or signs. Items can be toys, food, or any other item that the child prefers.

Step 2 – Create motivation to request the item
Once you have determined what motivates the child, block access or place the item out of the child's reach, but so they can see it. Wait for the child to request the item or prompt them to do so. The focus is on creating language and eye contact so do not have all preferred items available all of the time.

Step 3 – If the child provides eye contact when requesting the item.
If the child provides eye contact to indicate that he/she would like the item, provide the item without delay and tell the child "good job" or another positive statement after they provide eye contact.

Step 4 – If the child does not provide eye contact when requesting the item.
If the child does not provide eye contact, then wait 5 seconds. If the child does not provide eye contact after 5 seconds, prompt them to do so by saying: "look at me." If they do provide eye contact after a prompt, provide the item and tell the child good job or another positive statement after they provide eye contact.

Step 5 – Guided Practice
Let's practice.

Here is the item I like [provide item].
Hold the item out of reach.
As I request the item make sure I am providing eye contact. If I do not provide eye contact, wait 5 seconds. If I do not provide eye contact after 5 seconds, then say: "look at me". After I give you eye contact, tell me I did a nice job providing eye contact.

Parents have completed training when they can:

1. Withhold the item after a request until eye contact is provided by you
2. Prompting you to look at them if you aren't providing eye contact after 5 seconds
3. Praising you when you look at them.

Response Interruption and Redirection

Definition and Rationale:
The skill we are going to learn is redirecting repetitive behaviors. Repetitive behaviors are common in children with developmental disabilities. They include usual hand movements, rocking, making noises repeatedly, biting fingernails, and some forms of self- injury. One way to reduce repetitive behaviors is to redirect them and provide an alternative form of stimulation.

Step 1 – Identify repetitive behaviors and a competing behavior.

a) *Identify a behavior your child does repetitively.*
b) *Notice what parts of their body are used to perform this repetitive behavior.*
c) *Identify a task that uses the same parts of their body that they move repetitively.*
    - *For example, if your child shakes his hands in front of his eyes, you would select a task that uses his hands. This could be a high five, handshake, drawing, or giving him a toy. If your child makes repetitive noises, you could ask them to tell you their name or age.*

Step 2 – Gain the child's attention.

a) *Watch for your child to do the repetitive behavior.*
b) *When they are doing that repetitive behavior, get your child's attention or eye contact by saying their name.*

Step 3 – Verbal prompt for competing behavior.

a) *Ask your child to do the replacement activity or use the replacement item. Use a calm voice.*

Step 4 – Directing the child to the competing behavior.

a) *If your child does not stop the repetitive behavior or does not engage in the activity, then show your child how to do it. If the behavior does not stop, gently prompt your child by placing your hand over theirs and gently directing them to the task.*

Step 5 – Praise competing behavior.

a) *Praise your child when he/she does the task.*

Step 6 – Practice.

a) *Let's practice. Redirect my hands when I'm waving them.*

Start moving your fingers in front of your eyes. Do not play with the toy until the parent physically prompts you or hands you the toy.

Parent has completed training when he/she:

1. Tells you to play with the toy.
2. If you don't do play with the toy after the parent tells you to, the parent hands you the toy or physically prompts you.
3. Praises you for playing with the toy

APPENDIX B: IRB Consent Information

Institutional Review Board
for Human Subjects

Brigham Young University
A-285 ASB Provo, Utah 84602
(801) 422-3841 / Fax: (801) 422-0620

October 10, 2016

Professor Blake Hansen

340-C MCKB

Campus Mail

Re: X 16007

Parent Training in Southeast Europe: Strengthening Families of Children with Autism in Macedonia

Dear Professor Blake Hansen

This is to inform you that Brigham Young University's Institutional Review Board has reviewed your Amendment dated 10-5-2016 for the above captioned study. The changes to the study have been approved.

Your approval is contingent upon the receipt of the following:
- So that our files are complete, please forward the email exchange with Dr. Yudelevich.

A copy of the Informed Consent Document, approved as of 10-10-2016 is enclosed. No other consent form should be used. It must be signed by each subject prior to initiation of any protocol procedures. In addition, each subject must be given a copy of the signed consent form.

The approved period for the study ends on 1-19-2017. Any additional modifications in the research protocol, study site, personnel, or consent form during this time period must first be reviewed and approved by the IRB.

If you have any questions, please let us know. We wish you well with your research.

Sincerely,

Robert Ridge, PhD, Chair
Sandee Aina, MPA, Administrator
Institutional Review Board for Human Subjects

Consent to be a Research Subject

Introduction

This research study is being conducted by Blake Hansen, an assistant professor at Brigham Young University, Provo, Utah USA, to determine effective methods of teaching parents of children with disabilities how to manage simple challenging behaviors and teach skills. You were invited to participate because you have a child with a disability.

Procedures

If you agree to participate in this research study, the following will occur:

- Between October 24 and 26, you will be called for an informative session about the research and the trainings it would last 30 minutes so that you may learn more about the study and complete several forms. You will be informed about the time and location where the informative session would take place.
- Between October 24 and October 26 you may video record how you interact with your child. The videos should be up to 45 minutes over several sessions. We will provide you with a means to record you and your child.
- On October 27 or October 28 you will have a 45 minute training. You will be video recorded for 45 minutes during the training. You will be asked to complete several forms. You will be informed about the time and location where the training will take place.
- On October 29 you will be asked to give a short report about the research and the trainings and share your opinion about the research and training.
- We will provide all materials and be available to answer any question you may have.

Risks/Discomforts

There is a minor risk of loss of privacy through the research process. The researcher will mitigate this risk by assigning you a random number in place of your name on all stored documents. We will share video recordings with others only if you agree to allow the researcher to do so.

Benefits

There will be no direct benefits to you. It is hoped, however, that through your participation researchers may learn how to help parents of children with disabilities.

Confidentiality

The research data will be kept on a password protected computer and only the researcher and staff will have access to the data. At the conclusion of the study, all identifying information will be removed and the data will be kept in the researcher's locked office.

Compensation

Participants will receive $20 USD. We will provide you will all materials for this study.

Participation

Participation in this research study is voluntary. You have the right to withdraw at any time or refuse to participate entirely without jeopardy to your standing with Brigham Young University.

Questions about the Research

If you have questions regarding this study, you may contact Blake Hansen at blake_hansen@byu.edu; 801-422-4691 for further information.

Questions about Your Rights as Research Participants

If you have questions regarding your rights as a research participant contact IRB Administrator at (801) 422-1461; A-285 ASB, Brigham Young University, Provo, UT 84602; irb@byu.edu.

Statement of Consent

I have read, understood, and received a copy of the above consent and desire of my own free will to participate in this study.

Name (Printed): _____ Signature _____ Date: _____

Video Consent

I consent to be video recorded during training for a total of 45 minutes.

Name (Printed): _____ Signature _____ Date: _____

I consent to make a video of me interacting with my child for a total of 90 minutes.

Name (Printed): _____ Signature _____ Date: _____