

START THAT COEXISTENCE: THREE STUDIES OF PARENT RESPONSIVENESS TO CHILDREN WITH
OR AT-RISK FOR AUTISM SPECTRUM DISORDER

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ABSTRACT

Jessica L. Kinard: Start that Coexistence: Three Studies of Parent Responsiveness to Children with or At-Risk for Autism Spectrum Disorder
(Under the direction of Linda R. Watson)

This dissertation includes three studies of parent responsiveness to children with or at-risk for autism spectrum disorder (ASD). The first study examined the usefulness of a rating system compared with a coding system to measure parent responsiveness in an intervention study for toddlers at-risk for ASD. Two issues were examined: (a) correlations between parent responsiveness measured by the coding and rating systems; and (b) the sensitivity of the coding and rating systems to group changes in responsiveness. The coding and rating systems were significantly correlated on domains of responsiveness and affect, but not achievement or directiveness. Parents in the intervention group increased more in responsivity from entry to follow-up than parents in the control group as measured by the coding system, but not the rating system. The purpose of the second and third studies was twofold: (a) to examine the success of a parent responsiveness intervention (Adapted Responsive Teaching) for improving the social-communication of young children with ASD from Spanish-speaking families; and (b) to explore the caregivers' perspectives about the feasibility and acceptability of this intervention. The second study used a combined multiple baseline across participants and behaviors design. Baseline data were collected on social-communication behaviors for three Hispanic children with ASD (age range in years and months was 2.9 – 4.4). In the intervention, parents were taught responsiveness strategies to improve their child's social-communication. Treatment effects were demonstrated in: (a) two out of three children and (b) four out of seven targeted behaviors. These results provide moderate evidence for the ART intervention's effectiveness at improving social-communication in Hispanic children with ASD. In the third study, semi-structured interviews were completed with the children's parents before and after participating in the intervention. Qualitative analysis was used to explore themes in these families' experiences. Overall, parents perceived that the parent responsiveness intervention was feasible and acceptable for their families, and felt that it would also be applicable to other Hispanic families of children with ASD. Families' perceptions about early interventions seemed to depend on how well the intervention (a) addressed the families' concerns and priorities and (b) incorporated the families' strengths.

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LIST OF ABBREVIATIONS

AC	Auditory comprehension
ADOS	Autism Diagnostic Observation Schedule
ADOS-T	Autism Diagnostic Observation Schedule—Toddler Module
AOSI	Autism Observation Scale for Infants
ART	Adapted Responsive Teaching
ASD	Autism spectrum disorder
BAS	Bidimensional Acculturation Scale for Hispanics
CAM	Complementary and alternative medicine
CDSA	Child Developmental Services Agency
CLD	Culturally and linguistically diverse
EC	Expressive communication
EDP-I	Early Development Project-I
FDIT	Father-Directed In-Home Training
FRED-R	Family Routines Exploration and Description—Revised
FYI	First Year Inventory
GED	General Education Development
ICC	Intra-correlation coefficient
IDEA	Individuals with Disabilities Education Act
MBRS	Maternal Behavior Rating Scale
PLS-5S	Preschool Language Scale-5—Spanish Edition
PRCS	Parent Responsiveness Coding System
REIM	Referral to Early Intervention and Monitoring
RRB	Restricted and repetitive behavior
RT	Responsive Teaching
SA	Social affect
SCCS	Social-Communication Coding System
SCD	Single-case design

SD	Standard deviation
SES	Socioeconomic status
TEACCH	Treatment and Education of Autistic and related Communication handicapped Children
US	United States
WIC	Women, Infants, and Children

CHAPTER 1: INTRODUCTION TO THREE STUDIES OF PARENT RESPONSIVENESS TO CHILDREN WITH OR AT-RISK FOR ASD

The three studies in this dissertation present new findings about parent responsiveness in the field of autism spectrum disorder (ASD). The first study compares two methodologies for measuring parent responsiveness in the context of early intervention for infants at-risk for ASD. The second study is a single-case design, examining the success of a parent-responsiveness intervention for Hispanic toddlers and preschoolers with ASD. In the third study, the Hispanic parents who participated in the single-case design discuss their experiences with the parent-responsiveness intervention. To use the words of the participants, the motivation behind all three studies is “to start that coexistence”—to help parents of children with ASD “go inside that world” and create strong outcomes, both for themselves and their child. To provide a context for understanding the studies, this introduction will: (a) define parent responsiveness as it relates to ASD; and (b) highlight how the three studies incorporated parent responsiveness.

Defining Parent Responsiveness

Parent responsiveness has been identified as a fundamental component of parent-child interactions (Landry, Smith, Swank, Assel, & Vellet, 2001), and is strongly associated with social-communication development in children with ASD (Siller & Sigman, 2002, 2008). This association between social-communication and parent-responsiveness has sparked interest in developing parent-responsiveness interventions for children with ASD, particularly since social-communication deficits are a defining characteristic of the disorder (Karaaslan, Diken, & Mahoney, 2013; Mahoney & Perales, 2005; Venker, McDuffie, Ellis Weismer, & Abbeduto, 2012). If parent responsiveness fosters social-communication development, then this parenting style may be a powerful way to help children with ASD at an early age. The Transactional Model of Development provides a theoretical background for targeting parent responsiveness in early intervention (Sameroff, 2009). According to this theory, the child lives within a system of bidirectional influences, wherein the child influences the family’s outcomes and the family influences the child’s outcomes (Fiese & Sameroff, 1989, p. 297). By addressing parent responsiveness, interventions are designed to indirectly enhance child behaviors.

Highly responsive parenting styles are important for children who are typically developing, as well as children with developmental disabilities, including ASD (Koegel, Bimbela, & Schreibman, 1996; Mahoney & Perales, 2005; Siller & Sigman, 2002, 2008; S. F. Warren, Brady, Sterling, Fleming, & Marquis, 2010). Parent responsiveness may provide a protective effect for children who are at risk for developmental delays (Laucht, Esser, & Schmidt, 2001; S. F. Warren et al., 2010). Children appear to benefit most when the parent response is: (a) quick, meaningful, and produced in response to the child's focus of attention or communication attempt (Tamis-LeMonda, Bornstein, & Baumwell, 2001); (b) maintained at a high level over time (Landry et al., 2001; Tamis-LeMonda et al., 2001); and (c) differentiated into subtypes of behaviors, in order to meet the child's changing developmental levels (McDuffie & Yoder, 2010; Tamis-LeMonda et al., 2001; Venker et al., 2012). In contrast, redirections (i.e., asking the child to shift attention and behavior) are not considered to be useful for improving communication skills (Siller, Hutman, & Sigman, 2013; Siller & Sigman, 2002, 2008; Venker et al., 2012; Wan et al., 2012). However, some forms of directives are positively associated with children's later language skills, particularly when they relate to the child's focus of attention (McDuffie & Yoder, 2010; Tamis-LeMonda et al., 2001; Venker et al., 2012; S. F. Warren et al., 2010). Because of its powerful role in early development, parent responsiveness is incorporated into all three studies of this dissertation. Each of these studies, and its focus on parent responsiveness, is described briefly below.

Study 1: Measuring Parent Responsiveness in an Early Parent-Mediated ASD Intervention

Researchers are interested in the idea of parent responsiveness and its relationship to ASD outcomes, given the increasing number of ASD intervention studies targeting parent responsiveness (e.g., Carter et al., 2011; Estes et al., 2014; Green et al., 2013; Karaaslan et al., 2013; Siller et al., 2013; Siller, Swanson, Gerber, Hutman, & Sigman, 2014). Before researchers can delve into these interventions, however, they need to have a plan for measuring parent responsiveness. The construct of "responsiveness" is complex. Not only do definitions vary across research projects, but there are some aspects of the construct that can be objectively measured—observable behaviors like playing with the child's toy—and subjective qualities, like a parent's animation and joy during the interaction. In an attempt to capture this construct, researchers have developed two main methods for measuring parent responsiveness: (1) coding systems, which are used to tally specific instances of behaviors (e.g., P. Yoder & Stone, 2006); and (2) rating systems, which are used to provide an overall picture of the behaviors (e.g., Mahoney, 1999; Mahoney, Powell, & Finger, 1986). This first study examined these two methods of measuring parent responsiveness, in order to

determine their relative value for early intervention studies, depending on the type of questions researchers are asking.

Study 2: Parent-Mediated Intervention for Hispanic Families of Toddlers and Preschoolers with ASD

The second study examined the impact of a parent-responsiveness intervention on the social-communication skills of children with ASD, as well as parent responsiveness behaviors, using a multiple baseline across participants and behaviors design. Parent responsiveness was measured using the coding system of parent responsiveness that was evaluated in Study 1. Parent-responsiveness interventions have been studied previously, as noted above, but have been primarily developed and studied in mainstream cultures. Increasing evidence shows disparities in ASD healthcare among Hispanic families of children with ASD who are living in the United States (e.g., Magaña, Parish, Rose, Timberlake, & Swaine, 2012; Parish, Magana, Rose, Timberlake, & Swaine, 2012; Zuckerman et al., 2014). Scholars speculate that a reason for these disparities could be a culture clash—that mainstream interventions may not be as effective in culturally and linguistically diverse families, because of conflicting value systems (e.g., van Kleeck, 1994). To address these concerns, this second study recruited primarily Spanish-speaking families of children with ASD for participation in a parent-responsiveness intervention, and examined the intervention’s success for improving child social-communication skills in this culturally and linguistically diverse sample.

Study 3: “I Want to Learn More”: Hispanic Parents’ Experiences with Early ASD Interventions

Although findings about intervention effects are important, so are the perspectives of participating families. Simply finding treatment effects does not imply that families value the program. If culturally and linguistically diverse families experience a culture clash with mainstream interventions and/or practitioners, as noted above, then they could potentially learn parent-responsiveness techniques, but abandon them after the program is over, particularly if the program does not seem relevant to their lives (Barrera & Corso, 2002). Thus, for this third study, the focus changed from intervention effects to intervention experiences. Specifically, the Spanish-speaking parents from Study 2 participated in semi-structured interviews in Study 3, exploring their experiences with the parent-responsiveness intervention, as well as other interventions their child has received. In the interviews, the families discussed the topic of parent responsiveness, although they never used that terminology. Instead, parents talked about how parent involvement is important for developing “coexistence” between themselves and their child with ASD—and realizing that “the only thing the child is asking for is intimacy with the parent.”

Helping to create these positive parent-child interactions was one of the overarching goals of this dissertation, with the expectation that these interactions would help improve the children's social-communication skills. The three studies contributed to these goals in various ways, through the examination of measurement tools, treatment effects, and intervention experiences. The findings add important information to the parent responsiveness and ASD literature, taking a step toward the goal of improved child social-communication, parent-child intimacy, and coexistence.

CHAPTER 2: MEASURING PARENT RESPONSIVENESS IN AN EARLY PARENT-MEDIATED ASD INTERVENTION

Introduction

Currently, evidence indicates that parents of children with autism spectrum disorders (ASD) are as contingently responsive as parents of other children (Siller & Sigman, 2002; Watson, 1998), but that children with ASD may benefit more than children with other developmental disabilities from highly responsive parenting strategies (Siller & Sigman, 2002). In relation to responsivity, children with ASD may prefer solitary activities and have difficulty initiating and responding to joint attention (Davis & Carter, 2008; Paul & Norbury, 2012), potentially reducing the number of opportunities they have to engage in reciprocal interactions with their parents. As a result, parents of children with ASD may have to work harder (i.e., demonstrate even higher levels of responsiveness) than parents of other children to gain and maintain reciprocal interactions. As an added barrier, research indicates that parents of children with ASD, particularly mothers, often experience elevated feelings of stress and depression (Davis & Carter, 2008) which may impact their responsiveness. For example, mothers who are depressed may show less affect and communication, have fewer interactions with their children, and demonstrate overly-controlling or apathetic attitudes toward parenting (Field, 2010). Thus, these factors may play a role in a parent's responsiveness to his/her child.

There is a perceived need to help caregivers meet these challenges and optimize highly responsive interactions with their children with ASD. Thus, researchers are increasingly focusing on parent-mediated interventions for young children with or at-risk for ASD, such as Hanen Centre's More Than Words program (Carter et al., 2011; Patterson & Smith, 2011; Venker et al., 2012), Responsive Teaching (Karaaslan et al., 2013; Mahoney & Perales, 2005), Intervention in BASIS (Green et al., 2013), and other programs that include parental responsiveness as a key ingredient of the intervention approach.

An issue related to responsiveness research is deciding which methods are appropriate for measuring parent responsiveness. Across studies of parents of children with ASD, investigators have employed two main methods for measuring this variable: coding systems and rating scales. When using coding systems, researchers observe discrete

behaviors, counting the number of target behaviors that occur within a certain timeframe. When using rating systems, researchers observe graded behaviors, rating the “level” of target behaviors on a Likert scale.

To our knowledge, no published studies in ASD literature have used a combination of coding and rating systems to measure parent responsiveness. Most previous studies in the ASD literature have used coding systems to measure parent responsiveness (Carter et al., 2011; Flippin & Watson, 2011; Leezenbaum, Campbell, Butler, & Iverson, 2013; McDuffie & Yoder, 2010; Meek, Robinson, & Jahromi, 2012; Meirsschaut, Warreyn, & Roeyers, 2011; Siller et al., 2013; Siller & Sigman, 2002, 2008; Venker et al., 2012). Others have measured parent responsiveness with rating scales (Diken & Mahoney, 2013; Green et al., 2013; Karaaslan et al., 2013; Koegel et al., 1996; Larkin, Guerin, Hobson, & Gutstein, 2013; Mahoney & Perales, 2005; Wan et al., 2012). Studies outside the field of ASD have used a combination of coding and rating systems to measure parent responsiveness, such as with typically developing children (Barry, Kochanska, & Philibert, 2008), children from diverse cultures (Bornstein et al., 1992), and high-risk preterm children (Landry et al., 2001). One study examined a rating scale to determine its usability in clinical settings (Larkin et al., 2013), whereas most studies have used rating scales in research contexts (Green et al., 2013; Karaaslan et al., 2013; Koegel et al., 1996; Mahoney & Perales, 2005; Patterson, Elder, Gulsrud, & Kasari, 2013; Wan et al., 2012).

When coding systems were employed in the ASD literature, researchers either coded every instance of a target behavior (e.g., Siller et al., 2013), or coded the behaviors in intervals (i.e., coded the occurrence or nonoccurrence of a targeted behavior per time interval) (e.g., Meek et al., 2012). For example, one coding system designed by McDuffie and Yoder (2010) and used with minor adaptations in several studies, measured verbal and/or non-verbal parent responses in 5-second intervals (Carter et al., 2011; Flippin & Watson, 2011; McDuffie & Yoder, 2010). Among studies that have used rating systems, researchers have frequently measured levels of parent responsiveness and directiveness, among other behaviors, on a Likert scale (Green et al., 2013; Karaaslan et al., 2013; Mahoney & Perales, 2005; Wan et al., 2012). The Maternal Behavior Rating Scale (MBRS) is an example of this type of system (Karaaslan et al., 2013; Kim & Mahoney, 2005; Mahoney & Perales, 2005). When using the MBRS, researchers watch parent-child interactions, and then rate the parent’s behaviors on a scale of 1 to 5 for each of four dimensions, including the dimension of responsiveness.

In the current investigation, both the MBRS and a version of the McDuffie and Yoder (2010) coding system, which we will call the Parent Responsiveness Coding System (PRCS), were used to measure parent

responsiveness in the context of a quasi-experimental intervention study, examining the impact of a parent-mediated intervention for toddlers at-risk for ASD. The study used the MBRS as a way of rating parent responsiveness, and the PRCS as a way to code discrete parent response behaviors.

Collectively, previous studies have not explicitly examined which type of system would be the most advantageous for measuring parent responsiveness—coding systems, rating scales, or a combination of both. Larkin and colleagues (2013) suggest that coding systems may be most applicable to research contexts, where coders are trained to use computer coding software. In contrast, they argue that ratings systems may be most useful in clinical settings, where practitioners can more feasibly measure behaviors by methods that are less time-consuming and do not require expensive software. Based on this idea, Larkin and colleagues adapted a coding system to be used as a rating system and found that in clinical settings, the ratings could discriminate interactions among parent-child dyads with and without ASD (Larkin et al., 2013). However, Larkin and colleagues (2013) did not directly compare their coding system and the adapted rating system, either in the clinical or research context. Furthermore, they did not discriminate interactions between groups based solely on ratings of parent responsiveness; instead, three components were examined using the coding and rating scale: child joint attention, child engagement, and both child and parent responsiveness, as opposed to only parent responsiveness.

Without further studies, it is unclear whether one measurement system is more sensitive to change in parent behaviors over another system, and particularly if they measure parent behaviors equally or if they even measure the same constructs. In intervention studies targeting parent responsiveness, sensitive measurement of these behaviors is crucial, so that researchers can draw conclusions about the intervention's effect on parent responsiveness. In response to these issues, the current study examined two issues: (a) correlations between the MBRS and PRCS; and (b) each measure's sensitivity to group changes in parent responsiveness.

The use of both measurement systems was applied to a sample of parent-child interactions recorded before and after a specific ASD-focused intervention. The intervention we used is entitled the Adapted Responsive Teaching (ART) intervention (G. T. Baranek et al., 2015). The purpose of ART is to enhance parents' responsiveness to their children and, through these parent responses, improve child pivotal behaviors in the domains of social-communication and sensory-regulatory functions. The ART intervention was adapted from Responsive Teaching (RT) (Mahoney & MacDonald, 2007) to include content addressing sensory-regulatory issues and to fit the context of a home-based intervention with parents of very young toddlers at-risk for ASD. RT has been associated

with increases in parent responsiveness and with positive child outcomes in toddlers and preschool children with ASD, as well as children with other developmental disabilities, both in and outside the U.S. (Karaaslan et al., 2013; Kim & Mahoney, 2005; Mahoney & Perales, 2005).

The present study used data collected in a pilot study in which ART was provided to 1-year-olds at-risk for ASD (G. T. Baranek et al., 2015). For the current study, we first examined correlations between the PRCS and the MBRS. The PRCS has shown to be a reliable measure of parent responsiveness (Carter et al., 2011; Warren, Fey, & Yoder, 2005). The MBRS has also reliably identified changes in parent responsiveness (e.g., Karaaslan et al., 2013; Mahoney & Perales, 2005). Based on the past success of both systems, the working hypothesis was that high concurrent associations would exist between (a) coded parent responsiveness behaviors with the PRCS and (b) ratings of parent responsiveness on the MBRS.

Second, we examined the usefulness of each measurement tool in identifying group differences in parent responsiveness. Both the MBRS (e.g., Mahoney & Perales, 2005) and prior versions of the PRCS (e.g., Carter et al., 2011) have successfully detected differences in parent responsiveness between intervention and comparison groups. Based on these results, as well as the past success of the RT intervention in improving parent responsiveness (e.g., Karaaslan et al., 2013), our hypothesis was that parents would exhibit a greater change in their responsive behaviors after the ART intervention than parents in the comparison group, as measured by both the MBRS and the PRCS.

Methods

Participants

This study was approved by the Institutional Review Board at the University of North Carolina at Chapel Hill. The child participants in this study were enrolled in the Early Development Project-I (EDP-I), a study of the efficacy of ART for improving outcomes for 1-year-olds at-risk for ASD. The toddlers in the study were identified as at-risk using the First Year Inventory (FYI) (Baranek, Watson, Crais, & Reznick, 2003; Turner-Brown, Baranek, Reznick, Watson, & Crais, 2013).

The children were 12 months old at the initial screening, 13 – 17 months old at the entry (pre-intervention) assessment, and then spent 6 – 8 months in the intervention phase. After the intervention phase, the children were 22 – 26 months old at the post-intervention assessment and 30 – 35 months old at the diagnostic follow-up assessment. Data from the entry and follow-up assessments were analyzed for the present study. The EDP-I team recruited participants by mailing the FYI to families whose children were nearing their first birthday from January 2008 to

March 2009, with about 12,000 FYI packets sent overall. Recruitment occurred in five counties in central NC, and included both rural and urban communities. Recruitment was restricted to English-speaking families. In total, families completed and returned 2,261 FYIs during the grant period, an 18.8% response rate. Among the families willing to be contacted (91%, n = 2,064), parents were invited to participate in the entry evaluation based on meeting one of the following criterion: (a) their infant's risk score was at or above the 95th percentile on the FYI; (b) their infant scored at or above the 90th percentile on the FYI and parents reported concerns in the areas of core ASD symptoms; or (c) the parent reported a family history of ASD. The following children were excluded from further participation in the study, even if they met the above criteria: children with Down syndrome, cerebral palsy, significant prematurity, and/or significant vision or hearing difficulties, as reported by the parents. In addition, participants only included families who spoke mainly English at home.

Following the entry assessment, families were invited to participate in the intervention phase of the study if their child met at least one the following criterion, based on the entry evaluation: (a) he/she met ASD cutoffs based on the Autism Observation Scale for Infants (AOSI; Bryson, Zwaigenbaum, McDermott, Rombough, & Brian, 2008) (AOSI; Bryson, Zwaigenbaum, McDermott, Rombough, & Brian, 2008) or the Autism Diagnostic Observation Schedule—Toddler Module (ADOS-T; Luyster et al., 2009), (b) he/she demonstrated delays in social-communication development, and/or (c) he/she demonstrated symptoms in sensory-regulatory skills consistent with ASD. Among the 18 families who met eligibility criteria for inclusion in EDP-I, 11 families were randomly assigned to the ART intervention group and 5 were randomly assigned to a Referral to Early Intervention and Monitoring (REIM) group, using a 2:1 randomization ratio. Two additional families were eligible based on the entry assessment, but declined randomization. These families were referred to community early intervention services and agreed to return for follow-up assessments. They, along with families randomized to the REIM group, were included in a comparison group (n=7) for the current analyses.

In analyzing the data for the current study, three parent responsiveness videos were missing or damaged (one at entry and two at follow-up). Therefore, 17 families had complete parent responsiveness data at entry and 15 families had complete parent responsiveness and child communication data at both entry and follow-up. To answer research question 1, we examined data from the 17 families who had complete entry data (ART = 10; comparison group = 7). For research question 2, we examined data from the 15 families with complete parent responsiveness data at entry and follow-up time points, (ART = 9; comparison group = 6).

Sixteen of the 17 families with complete entry data provided demographic information about themselves, which is summarized as follows (see Table 1). One family in the REIM group declined to provide demographic information, and so is not included in the following descriptions. Across both groups, all of the children’s parents were married, except for one couple in the ART intervention group who was unmarried, but living together. The families in the ART intervention group had a mean annual household income of \$70,001 to 80,000 (maximum = \$150,001 to 200,000; minimum = \$20,001 to 25,000). In the REIM group, the families had a mean annual household income of \$80,001 to 90,000 (maximum = \$150,001 to 200,000; minimum = \$45,001 to 50,000). Across both groups, all fathers were currently working or in school, except for one father in the REIM group. In the ART group, 6 of the 10 mothers were currently working or in school; in the REIM group, 3 of the 6 mothers who provided information were working or in school. One family in each group was bilingual, and the other families spoke only English at home.

Table 1

Demographic Characteristics of Parents and Children with Complete Entry Data

	Children in the ART group (n = 10)	Children in the REIM group (n = 7)
Mother		
Age at entry (years)	Mean of 31.7 (range of 25 – 38)	Mean of 32.7 (range of 29 – 38)
Education	1 = vocational or trade degree after high school 1 = courses toward college degree 5 = college degree 3 = master’s degree	1 = courses toward college degree 2 = college degree 2 = master’s degree 1 = professional degree 1 = missing data
Father		
Age at entry (years)	Mean of 32.9 (range of 26 – 37)	Mean of 34 (range of 31 – 36)
Education	1 = 9 – 11 th grade 1 = associates or 2 year degree 1 = courses toward college degree 4 = college degree 2 = master’s degree 1 = professional degree	2 = associates or 2 year degree 3 = college degree 1 = professional degree 1 = missing data
Children		
Gender	9 boys; 1 girl	7 boys; 0 girls
Age at entry (months)	Mean of 14.9 (range of 13 – 17)	Mean of 15.6 (range of 13 – 17)
Age at follow-up (months)	Mean of 32.3 (range of 30 – 33)	Mean of 32.4 (range of 31 – 35)
Race	9 White; 1 Asian/White	5 White; 1 Black or African-American; 1 missing data
Ethnicity	10 non-Hispanic	6 non-Hispanic; 1 missing data

Note. ART = Adapted Responsive Teaching; REIM = Referral to Early Intervention and Monitoring

Setting

The caregivers and toddlers were assessed in a family-friendly research assessment room containing child-sized furniture and décor. During the intervention phase, the ART intervention occurred in families' homes.

Procedures

Entry assessment. Children who screened at-risk for ASD on the FYI at 12 months of age were invited for an intake assessment between 13 and 17 months of age. All families were referred to community services through the NC Child Developmental Service Agencies (CDSA), which determine eligibility in NC for Part C services under the Individuals with Disabilities Education Act (IDEA).

The full assessment protocol was extensive; here we describe only those measures used in the present analyses. For the entry assessment, assessors collected a sample of parent-child free-play. The assessors instructed the primary caregiver to play with his/her child as s/he normally would at home, and then left the parent and child to play together alone with a standard set of toys for 5-minutes. The interaction was video-recorded; the video was later rated and coded for parent responsiveness behaviors using the MBRS and the PRCS, respectively. Two fathers completed the parent-child free-play (each later randomized, one into the ART group and one into the REIM group), and 15 mothers completed the parent-child free play (9 later randomized into the ART group, 4 later randomized into the REIM group, and 2 who declined randomization but returned for follow-up and were included in the REIM group).

ART intervention group. The treatment group received 6 – 8 months of ART (average was 28 face-to-face sessions) provided in the home by trained interventionists, who were individuals with clinical training and experience (e.g., occupational therapists, speech-language pathologists, and early interventionists). Sessions lasted for about 1-hour, occurred two times per week at the beginning of the program, and were reduced to one time per week for the second half of the program with supplemental email/phone contacts (average was 5.8 contacts).

The interventionists taught parents about five dimensions of responsiveness: reciprocity, contingency, control, affect, and match. *Reciprocity* involves back-and-forth interactions. To be *contingent*, a parent responds quickly and meaningfully to a child's behavior. *Control* indicates that the parent allows the child opportunities to control the interaction. Having positive *affect* suggests that parents act in an excited, caring, and fun way with their child. To demonstrate *match*, parents take into account their child's developmental level and interests when interacting with them. Parents were taught to use responsiveness strategies in these domains to improve specific

social-communication and sensory-regulatory behaviors in their child. Social-communication behaviors targeted in ART include: social play, joint activity, joint attention, vocalization, intentionality, and conversation. Sensory-regulatory behaviors targeted in ART include: self-regulation, attention and arousal, exploration, engagement, adaptability and coping, and cooperation.

ART was individualized for each family according to their needs. Child goals were determined based on the child's assessment results, as well as conversations with the family about which social-communication and sensory-regulatory areas would be most important to address. The intervention context included daily routines the family identified. Each session targeted 1 or 2 parent responsiveness strategies, which were used to address the child's goals (e.g., using the strategy "take one turn and wait" to target the social-communication goal of "social play"). The interventionist first explained the strategy to the parent and then modeled using the strategy with the child. Next, the parent practiced using the strategy with the child, while the interventionist provided feedback and coaching. At the end of each session, the interventionist and parents developed "family action plans," designed to help parents plan how they would use what they had learned from ART throughout the week. Handouts about each strategy were given to families to keep in a notebook. In following sessions, the interventionist reviewed previously learned strategies with the parent to determine how well the strategy was working, answered any questions, and further explained the concepts.

Once the ART program finished, the families received a report about the strategies they learned, the social-communication and sensory-regulatory behaviors they targeted in their child, progress that was observed in these areas, and recommendations for the future. The child and family were then seen for post-intervention and follow-up diagnostic assessments.

Referral to Early Intervention and Monitoring (REIM) group. At the entry assessment, both ART and REIM groups, including the two families who declined randomization, were referred to services available in the community; however, the REIM group did not receive the ART intervention. During the intervention period, all randomized families (but not the two nonrandomized families) received monthly phone calls from the Project Coordinator of EDP-I to answer questions and track their community services. The extent to which families accessed community services was influenced by multiple factors, including parent choices, family resources, whether they received the ART intervention, and early intervention eligibility criteria.

Follow-up assessment. The follow-up assessments occurred approximately 6 months after the end of the intervention phase (30 – 35 months of age). For the purposes of the current analyses and to compare with the previous entry assessment, the parent and child engaged in a 5-minute parent-child free play session that was videotaped (measured with both the MBRS and PRCS). The two families who declined randomization returned for the follow-up assessment and thus were included in the REIM group used in this study.

Data Collection Methods and Instruments

Screening measure (at 12 months of age):

The First Year Inventory (FYI; Baranek et al., 2003; Reznick, Baranek, Reavis, Watson, & Crais, 2007; Turner-Brown et al., 2013) is a 63-item parent-report screening tool designed to identify infants-at-risk for ASD at 12 months of age. It includes questions focused on both social communication and sensory regulatory behaviors.

Measures of parental responsiveness (entry & follow-up assessments):

Parent Responsiveness Coding System (PRCS): Free play quantitative coding was completed using the same 5 minute parent-child free-play videos that were rated with the MBRS. Two coders, distinct from the MBRS raters, coded parent responsiveness with the PRCS using the Observer XT software program. The PRCS was adapted for this project from the “Partial Interval Time Sampling of Adaptive Strategies for the Useful Speech Project” (Yoder et al., 2010). In previous studies using this coding system, inter-rater reliability ranged from ICCs of 0.46 to 0.84 (Carter et al., 2011), ICCs of 0.93 to 1.00 (Flippin & Watson, 2011), and g coefficients above .80 (McDuffie & Yoder, 2010). Carter and colleagues (2011) explained that the low ICC of 0.46 could have been an artifact of between subject variability, rather than an accurate measure of inter-rater reliability, since ICC measurements also reflect between subject variability, which was low at their study’s first time point compared to the other time points.

In this system, coders watch parent-child interaction videos in 5-second intervals. First, coders determine whether the interval is “codable” (i.e., the parent and child behaviors are easily observable) or “uncodable” (i.e., the parent-child intervals are difficult to observe, such as if one person goes off-screen). If an interval is “codable,” the coders then determine if the child demonstrates interest in a referent (i.e., an object or person to which the child pays attention) by either looking at the referent and/or touching the referent. This is termed a “child lead,” and can be either “child-initiated” (i.e., the child spontaneously shows interest in a referent) or “child-adopted” (i.e., the parent introduces the referent to the child and, after a period of two intervals, the child continues to show interest in that

referent). Next, coders determine if the caregiver responds to the child’s lead. Caregivers can respond by (a) playing with the child’s referent, and/or (b) talking about the child’s referent, regardless of whether they are simply commenting about the referent (i.e., “follow-in comment”) or are directing the child to do something with the referent (i.e., “follow-in directive”). Comments or directives are not counted as follow-in utterances when: (a) the utterance is unrelated to the child’s referent; (b) the utterance is vague and is not specifically related to the child’s referent (e.g., “uh-huh,” “yeah”); (c) the utterance is part of a routine script, like reciting the alphabet; or (d) the utterance is meant to prevent or manage the child’s behavior.

When caregivers play with the child’s referent, coders determine whether the play is (a) helping the child with his/her play, (b) exactly imitating the child’s play or imitating and expanding on the child’s play, or (c) demonstrating a completely new action to the child, either with the child’s referent (e.g., the bus) or with an object that is related to the child’s referent (e.g., dolls on the bus). All of these are considered responsive play actions by parents. Play actions that are unrelated to the child’s referent are not counted as parent responses. See Table 2 for examples of these codes. To calculate a parent responsiveness score, the total number of “codeable” intervals is divided by the total number of intervals with parent responses and then multiplied by 100.

Table 2

Examples of Parent Responses in the Parent Responsiveness Coding System (PRCS)

	Parent response	Example
Follow-in utterance	Directive	• Child holds the baby doll. Parent says, “Feed the baby.”
	Non-directive	• Child plays the xylophone. Parent says, “What pretty music!”
Physical play act	Aids child’s action	• Child tries to put a shape into the shape sorter. Parent guides child’s hand to the correct shape.
	Exact imitation of child’s action	• Child hits the xylophone. Parent hits the xylophone.
	Imitation and expansion of child’s action	• Child presses buttons on a toy phone. Parent presses buttons on a toy phone and then puts the phone to his/her ear.
	Demonstration of new action on child’s referent	• Child pushes the toy airplane along the ground. Parent makes the toy airplane fly in the sky.
	Demonstration of new action on a different but related object	• Child holds the baby doll. Parent feeds the baby doll with a baby bottle.
“No response” counted	Utterance and/or action that is unrelated to the child’s referent	• Child plays the xylophone. Parent says, “Wow, look at this jack-in-the-box!” and starts spinning the jack-in-the-box handle.
	No action or utterance made	• Child puts dolls in a toy bus. Parent watches silently.
	Vague utterances that are not specific to the child’s referent	• Child stacks blocks. Parent says, “Uh-huh.”
	Utterance part of a script	• Child looks at a book. Parent reads the text from the book verbatim.
	Parent is managing the child’s behavior	• Child puts baby brush in his/her mouth. Parent says, “Don’t eat that, yucky.”

Maternal Behavior Rating Scale (MBRS; Mahoney, 1999; Mahoney et al., 1986): This measure is a 12-item rating (each item rated on a 5-pt. Likert scale) assessing four factors (or dimensions) of interactive style: Responsive/Child Oriented, Affect/Animation, Achievement Oriented, and Directive. The Responsive factor has 3 items to rate the following parent qualities: sensitivity (i.e., parent's awareness of child's actions and interests), responsiveness (i.e., parent's responses to child's actions and interests), and effectiveness (the degree to which the parent successfully encourages the child to engage in back and forth play). The Affect factor has 5 items to rate the following areas: acceptance (i.e., how accepting the parent seems to be of the child's behavior), enjoyment (i.e., how much the parent seems to be enjoying interacting with the child), expressiveness (i.e., the parent's level of body language and animation), inventiveness (i.e., how creatively the parent uses toys to engage the child), and warmth (i.e., how loving the parent acts toward the child). The Achievement factor includes the following 2 items: achievement (i.e., how much the parent seems to want the child to achieve certain skills) and verbal praise (i.e., how frequently the parent verbally praises the child for certain behaviors). The Directive factor includes the following 2 items: directiveness (i.e., how frequently the adult directs the child's behavior versus following the child's lead) and pace (i.e., the rate of the parent's actions, whether fast or slow). It should be noted that high Directiveness factor scores indicate high levels of directiveness, which are not encouraged in the ART intervention; therefore, we would expect lower levels of directiveness after participating in the ART intervention, but higher levels of responsiveness and affect. In previous studies using the MBRS, inter-rater reliability ranged from 74 – 100% exact agreement (Karaaslan et al., 2013), 75 – 100% exact agreement (Kim & Mahoney, 2005), and 60% exact agreement – 99% agreement within one scale point (Mahoney & Perales, 2005).

For this study, the primary caregiver was instructed to play with his/her child as s/he normally would at home, using a standardized set of toys. These free play sessions were video-recorded for 5-minutes. Two raters separately watched and rated the videos, and then created consensus scores together for each MBRS item. The item scores were then added together for each factor, creating four factor scores: Responsive, Affect, Achievement, and Directive.

Data Analysis

Nonparametric analyses were completed for all questions, due to the small sample size. Although multiple statistical tests were completed, conservative adjustments to alpha were deemed ill-advised; due to the exploratory

nature of this study and the limited sample size, we did not want to obscure potential signals by being overly conservative.

Question 1 was evaluated by conducting Spearman's *rho* correlational analyses on entry data to determine the strength and direction of the relationship between two measures of parental responsiveness: the MBRS and the PRCS. The critical value of *rho* informed Question 1.

Question 2 was evaluated by conducting Wilcoxon rank sum tests, comparing observed differences between parents in the ART and comparison groups on the amount of change from entry to follow-up intervention responsiveness scores, as measured by the MBRS and the PRCS. The critical value of *W* informed Question 2.

Results

All statistical analyses were completed with R version 3.0.2 (The R Foundation for Statistical Computing, 2013). The results are discussed below.

Group Differences on Demographic Characteristics

No statistically significant group differences were found in child demographic characteristics, based on Wilcoxon rank sum calculations of the following variables: gender ($W = 33, p = 0.52$), race ($W = 37.5, p = 0.19$); age at the entry assessment ($W = 25, p = 0.34$); and age at the follow-up assessment ($W = 38, p = 0.80$). No statistically significant group differences were found in parent demographic characteristics, based on Wilcoxon rank sum calculations of the following variables: mothers' age ($W = 25, p = 0.86$) and fathers' age ($W = 21.5, p = 0.55$); mothers' education level ($W = 22.5, p = 0.42$) and fathers' education level ($W = 32.5, p = 0.82$); mothers' employment ($W = 22, p = 0.38$) and fathers' employment ($W = 27.5, p = 0.71$); marital status ($W = 33, p = 0.52$); and language(s) spoken at home ($W = 25.5, p = 0.84$). All families were non-Hispanic in ethnicity.

Reliability of the PRCS Coding

Intra-correlation coefficients (ICCs) were calculated for 20% of the videos coded with the PRCS. First, reliability was calculated on coding of overall behavioral categories, which includes the following areas: (a) child leads: touch lead or look lead, and (b) parent responses: physical play or follow-in utterance. The ICC for overall behavioral categories was 0.95. Next, the ICC for coding parent responses was calculated, which includes physical play and follow-in utterances. The ICC for physical play responses was 0.84, and the ICC for follow-in utterances was 0.86. Third, reliability was calculated on coding of behavioral modifiers, which included the following areas: (a) child modifiers for touch and look leads: child-adopted or child-initiated; (b) parent modifiers for physical play:

exactly imitates child’s action, imitates and expands child’s action, aids child’s action, demonstrates new action on child’s referent; or demonstrates new action on a different but related object; and (c) parent modifiers for follow-in utterances: directive or non-directive. The ICC for coding of all behavior modifiers was 0.93. The ICC for coding of child modifiers was 0.93, and the ICC for coding of parent modifiers was 0.83. In the category of follow-in utterances, the ICC for “directive” utterances was 0.95.

Association between PRCS and MBRS Ratings of Parent Responsiveness

Descriptive statistics were calculated for each of the distributions used in this analysis: parent responsiveness scores using the PRCS, and scores for each factor on the MBRS: Responsive, Affect, Achievement, and Directive (see Table 3). All available data from the entry assessments were used in this analysis. Spearman’s *rho* was used to calculate correlations between the PRCS and MBRS. These correlations were calculated in order to determine if responsiveness as measured by both the PRCS and the MBRS Responsive factor demonstrated a similar pattern of association with the MBRS Affect, Achievement, and Directive factors. The results of this correlation analysis are presented in Table 4.

Table 3

Descriptive Statistics for PRCS Scores and Averaged MBRS Factor Scores at Entry

	PRCS (n = 17)			MBRS (n = 17)			
	Total Score ^a	Follow-in utterances	Physical play responses	Responsive	Affect	Achievement	Directive
Mean	54.78	37.99	32.52	3.12	3.19	2.71	3.06
Maximum	76.67	63.79	67.80	4.33	4	4	4
Minimum	30.61	15.00	11.76	2	2.2	1.5	2
Range	46.05	48.79	56.03	2.33	1.8	2.5	2
SD	14.03	14.39	16.87	0.66	0.56	0.71	0.53

Note. PRCS = Parent Responsiveness Coding System. MBRS = Maternal Behavior Rating Scale. SD = standard deviation.

^aPRCS Total Score consists of both follow-in utterances and physical play responses, including intervals when the responses occur separately (i.e., just a follow-in utterance or just a physical play response) and when the responses occur at the same time (i.e., both a follow-utterance and physical play response occurring simultaneously).

Next, we examined correlations between the two main subcategories of the PRCS and the MBRS factors: follow-in utterances and physical play responses. All available data from the entry assessments were used in this analysis. Descriptive statistics for the PRCS categories of follow-in utterances and physical play responses were examined (see Table 3). Correlations were examined with Spearman’s *rho*; results are presented in Table 4.

To further explore these data, we examined correlations between the PRCS subcategory of “follow-in utterances: directive” and the MBRS Directive factor. Descriptive statistics for the PRCS subcategory of follow-in

directives are as follows: mean = 19.65; range = 32 (minimum of 6 and maximum of 38); and standard deviation = 8.75. Correlations were examined with Spearman's ρ , and results indicated no significant correlations between the PRCS "Follow in utterance: Directive" category and the MBRS Directive factor ($\rho = 0.01, p = 0.97$).

Group Differences: Change in Parent Responsiveness

To answer question 2, we examined whether change in parent responsiveness differed between the intervention group and the comparison group, as measured by PRCS and the MBRS. Group differences were examined from entry to follow-up intervention assessments. Fifteen families had complete data from entry to post-intervention (9 families randomized into the ART group and 6 in the comparison group). The results are presented below.

Entry to follow up: PRCS. First, we examined group differences from entry to follow-up using the PRCS. In each group, descriptive statistics were calculated for changes in PRCS scores (see Table 5). A Wilcoxon rank sum test was conducted to evaluate group differences in amount of change in PRCS scores from entry to follow-up. The result indicated a significant difference between groups ($W = 45, p = 0.04$), with the ART intervention group achieving greater gains in use of parent responsiveness over the comparison group. For a visual depiction of the distribution of changes in each group, see Figure 1.

Next, we examined group differences in the two main subtypes of parent responsiveness in the PRCS: (a) amount of change in follow-in utterances; and (b) amount of change in physical play responses from entry to follow-up. Descriptive statistics were run on changes in follow-in utterances and physical play responses for each group (see Table 5).

A Wilcoxon rank sum test was conducted to evaluate group differences in the following PRCS categories: (a) amount of change in parent follow-in utterances; and (b) amount of change in parent physical play responses from entry to follow up. Results revealed significant differences between groups in change of follow-in utterances from entry to follow-up ($W = 47, p = 0.02$), but no significant differences in change of physical play responses ($W = 32, p = 0.61$).

Table 4

Spearman Rho Correlations between Entry PRCS Scores and MBRS Factors

		PRCS (<i>n</i> = 17)			MBRS (<i>n</i> = 17)			
		Total Score ^a	Follow-in utterances	Physical play responses	Responsive	Affect	Achievement	Directive
PRCS (<i>n</i> = 17)	Total Score ^a	----	<i>rho</i> = 0.57 <i>p</i> = 0.02*	<i>rho</i> = 0.65 <i>p</i> = 0.005**	<i>rho</i> = 0.62 <i>p</i> < 0.01**	<i>rho</i> = 0.46 <i>p</i> = 0.06	<i>rho</i> = 0.24 <i>p</i> = 0.35	<i>rho</i> = -0.12 <i>p</i> = 0.65
	Follow-in utterances		----	<i>rho</i> = -0.18 <i>p</i> = 0.50	<i>rho</i> = 0.58 <i>p</i> < 0.02*	<i>rho</i> = 0.70 <i>p</i> = 0.002**	<i>rho</i> = 0.32 <i>p</i> = 0.20	<i>rho</i> = 0.07 <i>p</i> = 0.79
	Physical play responses			----	<i>rho</i> = 0.38 <i>p</i> = 0.21	<i>rho</i> = 0.10 <i>p</i> = 0.70	<i>rho</i> = -0.05 <i>p</i> = 0.85	<i>rho</i> = -0.31 <i>p</i> = 0.23
MBRS: 4 Factors (<i>n</i> = 17)	Responsive				----	<i>rho</i> = 0.78 <i>p</i> < 0.001***	<i>rho</i> = 0.14 <i>p</i> = 0.58	<i>rho</i> = -0.30 <i>p</i> = 0.25
	Affect					----	<i>rho</i> = 0.28 <i>p</i> = 0.27	<i>rho</i> = 0.03 <i>p</i> = 0.90
	Achievement						----	<i>rho</i> = 0.68 <i>p</i> = 0.003**
	Directive							----

p* < 0.05, *p* < 0.01, ****p* < 0.001

Note. MBRS = Maternal Behavior Rating Scale. PRCS = Parent Responsiveness Coding System.

^aPRCS Total Score consists of both follow-in utterances and physical play responses, including intervals when the responses occur separately (i.e., just a follow-in utterance or just a physical play response) and when the responses occur at the same time (i.e., both a follow-utterance and physical play response occurring simultaneously).

Table 5

Descriptive Statistics for Change in PRCS and Averaged MBRS Scores from Entry to Follow-Up

	PRCS Change Scores						MBRS							
	Total Score ^a		Follow-in Utterance		Physical Play		Responsive		Affect		Achievement		Directive	
	ART (<i>n</i> = 9)	REIM (<i>n</i> = 6)	ART (<i>n</i> = 9)	REIM (<i>n</i> = 6)	ART (<i>n</i> = 9)	REIM (<i>n</i> = 6)	ART (<i>n</i> = 9)	REIM (<i>n</i> = 6)	ART (<i>n</i> = 9)	REIM (<i>n</i> = 6)	ART (<i>n</i> = 9)	REIM (<i>n</i> = 6)	ART (<i>n</i> = 9)	REIM (<i>n</i> = 6)
Mean	19.24	0.68	25.49	9.44	4.74	-5.05	0.85	0.06	0.49	0	0	0.23	0.39	0.08
Maximum	45.56	24.61	45	22.16	41.35	20.89	1.67	1.33	1.8	0.8	1.5	0.5	1.5	1
Minimum	-0.58	-13.95	4.46	0.82	-20.26	-30.22	-0.33	-1	-0.6	-0.8	-2.5	-0.5	-0.5	-1
Range	46.14	38.56	40.54	21.34	61.61	51.11	2	2.33	2.4	1.6	4	1	2	2
SD	16.36	13.93	13.18	8.27	19.50	21.59	0.78	0.83	0.78	0.63	1.22	0.42	0.60	0.66

Note. PRCS = Parent Responsiveness Coding System. ART = Adapted Responsive Teaching group. REIM = Referral to Early Intervention and Monitoring group. SD = standard deviation.

^aPRCS Total Score consists of both follow-in utterances and physical play responses, including intervals when the responses occur separately (i.e., just a follow-in utterance or just a physical play response) and when the responses occur at the same time (i.e., both a follow-utterance and physical play response occurring simultaneously).

Figure 1. Change in PRCS Scores from Entry to Follow-up

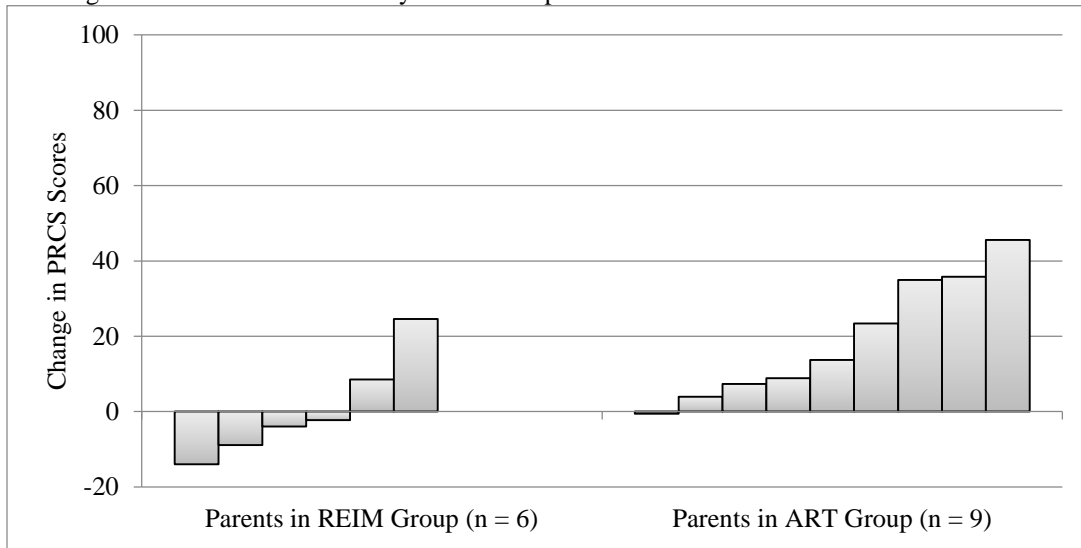


Figure 1. Change in parent responsiveness scores on the Parent Responsiveness Coding System (PRCS) from the entry to follow-up assessments. Each bar represents an individual parent change score. REIM = Referral to Early Intervention and Monitoring. ART = Adapted Responsive Teaching.

Entry to follow-up: MBRS factors. Descriptive statistical changes in averaged MBRS factor scores from entry to follow-up are provided in Table 5. A Wilcoxon rank sum test was completed for each factor, resulting in no significant differences between groups in terms of changes in any MBRS factor scores from entry to follow-up (Responsiveness: $W = 41, p = 0.11$; Affect: $W = 36.5, p = 0.29$; Achievement: $W = 22, p = 0.58$; Directive: $W = 33.5, p = 0.46$).

Discussion

Parent responsiveness may be an important component of early communication interventions, particularly for children with ASD, as suggested by emerging research in this area (Carter et al., 2011; Karaaslan et al., 2013; Mahoney & Perales, 2005; Venker et al., 2012). However, previous literature gives little guidance on how to measure parent responsiveness when conducting intervention research, such as with behavioral coding systems and/or rating systems. It is important that researchers recognize the impact of using one system versus another, particularly during intervention studies, so that they can choose appropriate measures for examining differences in parent responsiveness between groups.

To address these issues, we examined a rating scale and a behavioral coding system in the context of a quasi-experimental intervention study. For the rating scale, we implemented the Maternal Behavior Rating Scale (MBRS; Mahoney, 1999; Mahoney et al., 1986). For behavioral coding, we used the Parent Responsiveness Coding

System (PRCS), an interval coding scheme (Yoder et al., 2010). Both the MBRS and the PRCS were used to measure parent responsiveness, investigating the Adapted Responsive Teaching (ART) intervention. We examined the following issues: (a) associations between the MBRS and the PRCS system; and (b) each measure's sensitivity to group differences in parent responsiveness.

Associations between the PRCS and MBRS

The first finding was that, at entry, overall scores on the PRCS were significantly and positively correlated with the MBRS Responsive factor. In other words, the more parents were coded as having a high percentage of responsive behaviors on the coding system (i.e., a combination of follow-in utterances and physical play responses), the more parents were rated as responsive on the MBRS. It was expected that the MBRS Responsive factor and PRCS would be correlated, as each system is intended to measure how responsive a parent is to his/her child. This relationship indicates that the PRCS and MBRS Responsive factor measure similar behaviors in parents and, thus, have good concurrent validity.

On the other hand, overall scores on the PRCS and the MBRS Affect factor were not significantly correlated, although there was a trend in the direction predicted. Given the small sample size, it may be important to re-examine this question in the future. Indeed, when the overall PRCS scores were examined as subcategories of follow-in utterances and physical play responses, follow-in utterances were significantly and positively correlated with both the MBRS Responsive and Affect factors. This finding indicates that parents who used more follow-in utterances, according to the PRCS, were more likely to be rated as highly responsive and as having high affect on the MBRS. Furthermore, the MBRS Responsive and Affect factors were also significantly and positively correlated with one another, but not with the other MBRS factors. Collectively, these findings suggest that parents who are rated and coded as highly responsive, at least in terms of follow-in utterances, may be more likely to receive ratings of high affect, and vice versa. This result is interesting, given that the PRCS does not directly measure affect.

In contrast, the PRCS subcategory of physical play responses was not significantly correlated with either the MBRS Responsive or Affect factor; however, there was a small positive correlation with both of these MBRS factors, particularly the MBRS Responsive factor. This finding is contrary to what was expected, given that the MBRS counts parents' play actions in both the Responsive factor (e.g., keeping child engaged in a turn-taking play interaction) and the Affect factor (e.g., playing with the child in innovative ways). A potential explanation is that, when using the MBRS, raters may be more likely to notice or interpret follow-in utterances as responsive, as

opposed to physical play actions, even though both verbalizations and play actions are included in the MBRS definitions. For example, the MBRS Affect factor includes an item called “acceptance,” which is determined by how much the parent seems to approve of the child’s behavior, using words or physical behaviors. This quality may be more noticeable if the parent states his/her acceptance of the child’s behavior (e.g., “I like what you’re doing”) versus physically showing acceptance (e.g., going along with the child’s activity). At this point, however, these explanations are only speculation; it would be worthwhile to examine these correlations in a larger sample, to determine more specifically how the PRCS and MBRS Responsive and Affect factors relate.

In terms of the MBRS Achievement factor at entry, no significant correlations were found with the PRCS, either with overall scores (i.e., a combination of follow-in utterances and physical play responses) or with subcategories of parent responses (i.e., follow-in utterances or physical play responses). It is not surprising that the PRCS was not significantly related to the MBRS Achievement factor, since the PRCS does not directly measure how much parents encourage their children to achieve certain skills. The MBRS Responsive and Affect factors also lacked significant correlations with the MBRS Achievement factor. Despite this non-significance, the MBRS Achievement factor did have small positive correlations with overall PRCS scores and the PRCS subcategory of follow-in utterances, as well as with MBRS Responsive and Affect factors. These findings suggest that responsiveness and achievement orientation are not mutually exclusive behaviors; a parent who is responsive to his/her child’s interest could also be encouraging their child to achieve skills. A stronger relationship was found between MBRS Achievement and Directive factors, which were significantly and positively correlated. It may be that parents who are highly directive are more noticeably trying to get their child to “perform” or achieve certain skills, as opposed to parents who follow their child’s lead more often than directing them.

In terms of directiveness, overall PRCS scores at entry were not significantly related to entry scores on the MBRS Directive factor. Interestingly, there was a small negative correlation between the PRCS and the MBRS Directive factor. The MBRS Responsive factor was also negatively correlated with the MBRS Directive factor, although non-significantly. The direction of these correlations was expected, because it seems logical that parents who respond to their child’s focus of attention are less likely to redirect their child to other activities. The fact that both the PRCS and the MBRS Responsive factor were negatively correlated with the MBRS Directive factor provides further evidence that the two systems are measuring similar behaviors and associations related to responsiveness.

The PRCS does measure an aspect of parent directiveness, but one that differs conceptually from the overall MBRS Directive factor. In the PRCS, coders determine whether parents talk about the child's focus of attention and, if so, whether these utterances are directive (i.e., telling the child what to do) or non-directive (i.e., commenting without telling the child what to do). Both types of utterances are counted as "responsive," as long as the parent talks about the child's current interest, as indicated by what the child is looking at or touching. In contrast, on the MBRS Directive factor, raters do not determine how much the parent is following the child's lead, per se— simply how much the parent is directing the child's behaviors, regardless of whether these directions are related to the child's focus of attention. The MBRS Directive factor also includes a category for "pace," which rates how active the parent is during the parent-child interaction. When we compared these domains, the PRCS subcategory of follow-in utterances was not significantly correlated with MBRS Directive; there appeared to be no correlational trend in either the positive or negative direction. Overall, it seems reasonable that the PRCS and MBRS Directive factors were not strongly correlated, since they only overlap on one construct (follow-in directives) and differ on several other constructs (physical play responses, follow-in comments, and pace).

To investigate these findings further, we examined correlations between the PRCS follow-in directives category and the MBRS Directive factor. No significant relationship was found, indicating that even when the PRCS was only used to measure follow-in directives, it did not capture the same information as the MBRS Directive factor. This finding likely reflects that the PRCS only measures directive utterances related to the child's interest, whereas the MBRS Directive factor rates a parent's "overall" directiveness, including follow-in directives, redirections, directive physical behaviors, and a rapid pace. It seems that the number of directives a parent provides that are responsive to the child's interests does not predict how directive he/she will be overall in interactions with the child.

This finding is important to discuss in the context of previous discussions of directiveness. In some studies, researchers have excluded all forms of directives from their measures of responsivity, even if the directive relates to the child's current attentional focus (e.g., Carter et al., 2011; Siller et al., 2013; Siller & Sigman, 2002, 2008). For example, in Siller and colleagues' program of research, the investigators have used a coding system that measures a parent's synchrony with the child's interest (i.e., communicating about the child's focus of attention), as well as synchrony with the child's actions (i.e., communicating about the child's focus of attention, but not requesting that the child change his current actions). The parent's behavior is counted as unresponsive if it is not synchronized with

both the child's interest and actions (Siller et al., 2013; Siller & Sigman, 2002, 2008). Therefore, in contrast to the PRCS in the current study, Siller and colleagues' system excludes follow-in directives.

From a different perspective, researchers have argued that directive utterances can be considered responsive, as long as they are related to the child's current focus of attention. McDuffie and Yoder (2010) documented that, for children with ASD, parents' non-directive and directive follow-in utterances were equally predictive of children's later spoken vocabulary. Based on these findings, the researchers proposed that talking about children's focus of attention has an important influence on the language development of children with ASD, regardless of whether the parent is telling the child what to do or simply commenting on the child's interest (McDuffie & Yoder, 2010). In the case of our current findings, coding follow-in directives appears to capture a different construct than rating an "overall" directive manner, since the PRCS follow-in directives and MBRS Directive factors were unrelated.

Sensitivity to Group Differences in Parent Responsiveness

Second, we examined differences between the ART intervention group and the REIM group, in terms of how much parent responsiveness changed over time. Before discussing these findings, it should be noted that measures of "parent responsiveness" are inherently dyadic variables, according to the Transactional Model of Development (Fiese & Sameroff, 1989; Sameroff, 2009). In both the MBRS and the PRCS, "parent responsiveness" is measured while taking into account the child's attentional lead. As children demonstrate interest in objects (e.g., by looking at and touching the objects), parents have opportunities to respond to these interest areas. Therefore, as we discuss parents' change in responsiveness over time, it should be kept in mind that parental behaviors may also reflect changes in the children's behaviors.

According to overall PRCS scores (i.e., a combination of both follow-in utterances and physical play responses), parents in the ART intervention group made significantly greater increases in parent responsiveness from entry to follow-up than parents in the REIM group. This result provides encouraging support for the ART intervention, suggesting that parents who participated in ART made greater changes in responsiveness than the REIM group, changes which were maintained even six months after the program had ended.

Significant differences were also found when the PRCS subcategory of follow-in utterances was examined, indicating that parents in the ART group made significantly greater increases in how much they talked about a child's focus of attention from entry to follow-up, as opposed to parents in the REIM group. However, no significant

differences between groups were found when the PRCS subcategory of “physical play responses” was examined by itself, although the trend was in the direction of showing greater increases in the ART group. In other words, parents in both groups responded to their children using similar amounts of play actions (e.g., helping the child with a toy on which the child’s attention was focused). This finding is in contrast to what we expected, since the ART intervention does encourage parents to engage in more responsive play with their children.

Changes in MBRS scores were also examined from entry to follow-up, but no significant differences were found between groups on any of the factors, including Responsive, Affect, Achievement, or Directive factors. These findings are noteworthy for several reasons. First, the MBRS Responsive factor and PRCS are significantly and strongly correlated, so it seems logical that each measure would produce similar findings. Although findings were in the same direction, the results suggest that the PRCS was more sensitive to group differences in responsiveness in this study than the MBRS Responsive factor, despite the strong correlation between the two measures.

Second, we expected parents in the ART intervention group would increase affect, since that is a quality taught as a responsive strategy in the intervention; however, no group differences were found for changes on the MBRS Affect factor. The PRCS system does not directly measure affect, even though the PRCS follow-in utterance scores have a strong, significant positive correlation with the MBRS Affect factor; thus, it is difficult to determine whether the MBRS Affect factor is more or less sensitive to group changes than the PRCS, or whether parents in the ART group simply did not make greater changes in affect than parents in the REIM group. It is possible that certain subgroups of parents responded differently to the intervention; however, a larger sample would be needed to examine this possibility. In any case, the non-significant results suggest that researchers should be careful about indirectly measuring parent affect through parent responsiveness, based on the idea that the constructs are significantly correlated. Instead, it may be prudent to use a specific measure of affect, rather than relying only on a measure of responsiveness, particularly if affect is an important component of the intervention.

Previous studies have found that parents of children with ASD significantly increased responsivity and affect after participating in parent-mediated responsiveness interventions, as measured by the MBRS alone (e.g., Karaaslan et al., 2013; Kim & Mahoney, 2005; Mahoney & Perales, 2005). These findings are in contrast to the current study, wherein we found group differences using the PRCS, but not with the MBRS Responsive or Affect factors. There are several possible reasons for these contradictory findings.

First, the children in our study started participating at an average age of 14.7 months, which is younger than the children in previous investigations, who started participating at an average age of 26.4 months in one study (Mahoney & Perales, 2005), and were age 3 – 6 years (Karaaslan et al., 2013) and 3 – 8 years (Kim & Mahoney, 2005) in two other studies. Parents may respond differently to younger versus older children (Meirsschaut et al., 2011), which could influence how behaviors are rated on the MBRS and the extent to which they change with intervention. According to Tamis-LeMonda and colleagues (2001), children are ready to learn certain skills at certain ages, and they may benefit from types of responsiveness that “match” their current skill level. In Mahoney and colleagues’ research (Karaaslan et al., 2013; Kim & Mahoney, 2005; Mahoney & Perales, 2005), it is possible that the parents were using types of responsiveness that matched the children’s older ages and were detected by the MBRS, but were not applicable to the younger age group in our study. Furthermore, in terms of affect, it is well documented that infant-directed speech conveys higher levels of positive affect than adult-directed speech, or even child-directed speech (Saint-Georges et al., 2013). According to a systematic review, infant-directed speech as a distinct register tends to reach its height at about 6 months of age, and diminishes as children approach two years of age (Saint-Georges et al., 2013). Thus, it is possible that the parents in our study started out with relatively high levels of affect, since their children were still 1-year-olds, and so had less “room to grow” over the course of the study, when compared to the parents in Mahoney and colleagues’ program of research, whose children were all older than two years of age (Karaaslan et al., 2013; Kim & Mahoney, 2005; Mahoney & Perales, 2005).

Parental education levels may also have influenced the results. The parents in our study had high levels of education in both the ART and comparison group; most of the parents had post-high-school degrees (e.g., associates, college, master’s, and professional degrees) and only one parent had not completed high school. In contrast, the parents in Mahoney and colleagues’ program of research appear to have had lower levels of education, overall. For example, in Karaaslan and colleagues’ study (2013), parents in both treatment and control groups had an average of 9.5 years of education, suggesting many had not completed high school. The parents in the Kim and Mahoney’s study (2005) had an average of 13.60 years of education in the intervention group and 12.63 years of education in the control group, suggesting that they may have pursued some education after high school, but may not have received a second degree. In Mahoney and Perales’ research (2005), the parents had somewhat higher levels of education (treatment group average of about 15.5 years and control group average of about 14.8 years). It is possible

that parents with more education start out with interaction styles characterized by higher responsivity and affect, and so have fewer opportunities to show change in these skills.

Parental race and ethnicity is another important factor to consider, when comparing these results across studies. For many years, the literature has reported differences in parenting styles across cultures (e.g., Bush & Peterson, 2013; van Kleeck, 1994). The parents in Mahoney and Perales (2005) had similar racial and ethnic backgrounds to our participants; the majority of the sample was White, non-Hispanic. However, other studies in Mahoney and colleagues' program of research took place in countries outside of the United States: Korea (Kim & Mahoney, 2005) and Turkey (Karaaslan et al., 2013). According to the literature, traditional Korean parenting styles involve strict control of children's behaviors and more subtle, nonverbal displays of affection (Choi, Kim, Kim, & Park, 2013). In traditional Turkish parenting styles, parents often require obedience and respect in their children, but also display high levels of affection, particularly among mothers (Yagmurlu & Sanson, 2009). Therefore, the parents in these studies may have started out with lower levels of responsiveness (Karaaslan et al., 2013; Kim & Mahoney, 2005) and/or affect (Kim & Mahoney, 2005) compared to parents in the present study, at least according to Western parenting views, and so had opportunities for greater change in these areas.

Another possibility is related to the children's diagnoses. In our study, the children were identified as "at-risk" for ASD, but were not diagnosed with the disorder. On the other hand, the participants in Mahoney and colleagues' studies were diagnosed with a variety of conditions, including Down syndrome, ASD, cerebral palsy and developmental or intellectual disabilities (Karaaslan et al., 2013; Kim & Mahoney, 2005; Mahoney & Perales, 2005). It is possible that parents respond differently to children with diagnosed conditions as opposed to children who are demonstrating warning signs of a condition but are not yet diagnosed. Furthermore, parents may respond differently to ASD-related characteristics than to other conditions, particularly in cases where the other condition is visibly apparent through physical characteristics, such as with Down syndrome. For example, parents of children with Down syndrome have been noted to use different levels of prosody than parents of children with "invisible" cognitive impairments (i.e., no characteristic physical traits accompanied the condition) (Saint-Georges et al., 2013). Thus, it is possible that the MBRS picked up on group differences in previous studies, but not our current study, because the parents were responding in alternate ways to their children, based on the child's diagnosis or at-risk status.

Third, our study investigated the Adapted Responsive Teaching (ART) program, whereas Mahoney and colleagues' research examined the Responsive Teaching (RT) program (Karaaslan et al., 2013; Kim & Mahoney, 2005; Mahoney & Perales, 2005). These interventions both use the same responsive teaching strategies, and much of the social-communication content is the same in each program. However, the ART and RT interventions have been provided at varying levels of intensity or with varying schedules. In the current study, ART sessions were provided in the home for 6 to 8 months, 60-minutes per session. Sessions were planned to occur 2 times per week at the beginning of the program, and then 1 time per week for the second half of the program; the actual total number of sessions averaged 27.6 in this study. In Mahoney and colleagues' program of research, RT was provided at somewhat greater levels of intensity and/or on different schedules than ART for at least two studies, as follows: (a) 90-minute sessions, 2 times per week for 4 months (Karaaslan et al., 2013); (b) 60-minute sessions, 1 time per week for a year, for an average of 32.6 sessions (Mahoney & Perales, 2005). Perhaps these varying levels of intensity and/or varying schedules influenced how much parents increased their responsiveness and, therefore, how easily the MBRS could detect group differences.

Finally, sample size may play a role in the contradictory findings. In the current study, we had complete data for 15 parent-child dyads. Although the PRCS detected significant differences using this sample, it is possible that the MBRS needed additional statistical power to identify group differences. In one study where the MBRS detected group differences, the sample size included more participants than the current study: 50 parent-child dyads (Mahoney & Perales, 2005). This larger sample size may have provided the additional statistical power to find significant differences between groups on the MBRS. However, two studies using the MBRS had sample sizes comparable to the present study, and were able to find statistically significant differences between groups on the MBRS: 18 parent-child dyads (Kim & Mahoney, 2005) and 19 parent-child dyads (Karaaslan et al., 2013).

In support of our findings, other intervention studies have also found group differences in parent responsiveness based on measures similar to the PRCS (e.g., Siller et al., 2013; Venker et al., 2012). For example, Siller and colleagues (2013) examined a parent-mediated intervention called Focused Playtime Intervention (FPI), which aims to increase parents' use of responsive behaviors in order to improve the communication skills of preschoolers with ASD. According to a behavioral coding system, mothers categorized as "insightful" (i.e., able to interpret child behaviors and motivation) significantly increased their use of responsive behaviors after participating in the intervention group, when compared to a control group (Siller et al., 2013). As another example, Carter and

colleagues (2011) and Venker and colleagues (2012) examined a parent-mediated intervention, Hanen's More Than Words (HMTW) program, which teaches parent responsiveness in order to increase children's communication. Using a behavioral coding system, Carter and colleagues (2011) did not find significant differences in parent responsiveness between the intervention group and the control group; however, the effect sizes were medium to large, suggesting that the parents in the intervention group were making greater increases in responsiveness. Also using a behavioral coding system, Venker and colleagues (2012) found that parents in the treatment group made greater increases in responses and greater decreases in redirections, when compared to a delayed treatment group.

Collectively, although the previous studies (Carter et al., 2011; Siller et al., 2013; Venker et al., 2012) and the current study varied in the ages of the participants, diagnostic status of the participants (i.e., ASD diagnoses or at-risk status), sample size, and the specific content and intensity of the interventions aimed at increasing parent responsiveness, the findings suggest that behavioral coding is an appropriate method for measuring parent responsiveness, being sensitive enough to capture differences between groups in intervention studies. The focus of the PRCS, used in this study, however, is specifically on the contingency dimension of parent responsiveness, and thus this tool may not be ideal for evaluating changes in other aspects of parent responsiveness that are addressed in parent responsiveness intervention programs.

Future research should continue to explore the MBRS Responsive factor and PRCS, in terms of their ability to detect changes in groups over time. The findings from previous studies indicate that the MBRS alone may be sufficient for determining group differences in responsiveness and affect (Karaaslan et al., 2013; Kim & Mahoney, 2005; Mahoney & Perales, 2005). However, our study suggests that the PRCS may be more sensitive to group changes in responsivity than the MBRS Responsive factor. It is possible that behavioral coding systems may be more applicable than the MBRS for studies in which changes in parent responsivity might be harder to detect, such as with the following characteristics: small sample sizes; at-risk populations; parents with initially high levels of responsivity and affect; and/or younger age groups. Future studies could also explore the value of adding an "affect" component to coding schemes like the PRCS, to reduce the number of measurement systems used in a study. Another consideration for future research is the context of parent-child observations. In the present study, we examined parent-child interactions in one context only (free-play using standardized toys in a lab setting). Future studies could explore the benefits of observing parent-child interactions in one versus multiple contexts.

Overall, the current study's findings may help researchers determine which method they should use when measuring parent responsiveness. There were many benefits to using the PRCS. With a small sample size, the PRCS was able to capture significant differences between groups, in terms of how much parents increased their use of responsiveness from entry to follow-up, whereas the MBRS Responsive factor did not detect these differences. It is possible, then, that the PRCS is a powerful tool for measuring changes in responsiveness. In addition, the coding system yielded a wide range of responsiveness scores (ART range = 46, CS range = 39), whereas the MBRS Responsive factor had a limited range (ART range = 2, CS range = 2). Having a wider range of possible scores may allow researchers to examine finer-grained differences between participants. Indeed, in the current study, the parents in the ART group demonstrated wide variability in how they responded to the intervention; some parents made large gains according to the PRCS (e.g., 45.56 score difference from entry to follow-up), whereas other parents made no gains (e.g., -0.58 score difference from entry to follow-up).

The MBRS may provide a valuable tool for measuring affect, achievement, and directiveness for several reasons. First, the PRCS does not directly measure affect and achievement, is not significantly correlated with MBRS Achievement, and is only significantly correlated with MBRS Affect when "follow-in utterances" are examined independently from physical play acts. Second, even though the PRCS measures directive follow-in utterances, it was not significantly related to the MBRS Directive factor, suggesting that these two measures are capturing different constructs of directiveness. It is possible that the PRCS could be adapted to measure directiveness and affect, as the MBRS does, but the validity of these modifications would need to be examined in further research.

Conclusion and Future Directions

Both the PRCS and MBRS seem to be valuable options for measuring parent responsiveness. The PRCS was positively and significantly related to the MBRS Responsive factor, and was positively and significantly related to the MBRS Affect factor when "follow-in utterances" were examined independently. However, the PRCS successfully identified differences between groups from entry to follow-up in a small sample, in short (5-minute) video segments, and in a clinic setting, whereas the MBRS Responsive factor did not detect these differences, despite the correlation between the two measures. Furthermore, the coding system resulted in a wide range of parent responsiveness scores. Together, these results suggest that this coding system was: (a) a valid measure of parent

responsiveness; and (b) a more sensitive tool for identifying differences in parent responsiveness behaviors than the MBRS within the current sample.

Many areas could be examined further, based on the results of this study. First, the PRCS could be adapted to measure parent directiveness and affect, and then be compared to the MBRS Affect and Directive factors. Second, since this study was based on a small sample size, it would be useful to replicate these analyses in a larger study with a more diverse group of participants. For example, it would be interesting to examine whether the impact of the ART intervention on parent responsiveness varies based on different cultural and socio-economic backgrounds of the caregivers. A larger sample would also allow researchers to examine the extent to which parent responsiveness predicts child communication outcomes, using either the PRCS or the MBRS.

CHAPTER 3: PARENT-MEDIATED INTERVENTION FOR HISPANIC FAMILIES OF TODDLERS AND PRESCHOOLERS WITH ASD

Introduction

Hispanic populations in the United States (US) have grown rapidly over the past decade (Humes, Jones, & Ramirez, 2012) and have experienced one of the largest increases in autism prevalence when compared to other populations, currently estimated at 10.8 per 1000 Hispanic children in the US diagnosed with an autism spectrum disorder (ASD) (MMWR, 2014). This growing population needs a support system, one that includes accessible, high-quality intervention. From what is currently known, however, US Hispanic families have poor access to ASD services (Harstad, Huntington, Bacic, & Barbaresi, 2013) and report losing trust in the healthcare system due to negative experiences (Zuckerman et al., 2014). In turn, practitioners report encountering cultural and linguistic barriers when diagnosing ASD in Hispanic children (Zuckerman et al., 2013). These findings emphasize the importance of establishing culturally relevant interventions for Hispanic families of children with ASD.

The term “Hispanic” refers to Spanish-speaking families from many locations and cultures, meaning that, as Hispanic populations grow in the US, so do the variety of Hispanic cultures. Cultural beliefs greatly influence healthcare practices (Kleinman, 1978; Mandell & Novak, 2005). If intervention strategies conflict with a family’s cultural beliefs, the family is less likely to adopt the intervention (van Kleeck, 1994). Thus, the barriers that US Hispanic families are encountering may be partly due to lack of culturally relevant and family-centered care. For example, some US Hispanic caregivers have reported a preference for culturally-adapted parenting classes, rather than “clases de blancos” [white classes] (Parra Cardona et al., 2009, p. 221). From a different viewpoint, other Hispanic caregivers have reported wanting the same program as “mainstream” families (Kummerer, Lopez-Reyna, & Hughes, 2007). These conflicting findings indicate that, although the term “Hispanic” was used to describe all of these families, a variety of cultures and beliefs exist within Hispanic populations. Assuming that ASD interventions work equally well across mainstream and Hispanic cultures likely contributes to the disparities experienced by Hispanic families (Harlin & Rodriguez, 2009; Wilder, Dyches, Obiakor, & Algozzine, 2004). A detailed examination of intervention success in this population would help determine whether mainstream programs should

be: (a) implemented as they currently exist; (b) adapted to fit a family's culture, and if so, how; or (c) put aside in place of a different intervention program (van Kleeck, 1994).

This study addresses the need for ASD intervention research with Hispanic families by examining an early ASD intervention targeting caregiver responsiveness and child social-communication skills with primarily Spanish-speaking families in the US. Considerable prior research suggests that interventions targeting caregiver responsiveness can be helpful in promoting better social-communication outcomes for children with ASD. The developmental literature reports associations between highly responsive parenting and later social-communication achievements in longitudinal studies of typically developing children (Landry et al., 2001; Tamis-LeMonda et al., 2001), as well as children with ASD (Siller & Sigman, 2002, 2008). These relationships are reported when the caregiver response includes the following three characteristics: (a) is prompt, meaningful, and produced in response to the child's focus of attention (Tamis-LeMonda et al., 2001); (b) is maintained at a high level over time (Landry et al., 2001; Tamis-LeMonda et al., 2001); and (c) consists of many types of responses, in order to meet the child's changing developmental levels (McDuffie & Yoder, 2010; Tamis-LeMonda et al., 2001; Venker et al., 2012). Redirecting the child's behavior is not associated with positive child communication outcomes; however, directive behavior may support communication, as long as these behaviors are related to the child's current interest (McDuffie & Yoder, 2010; S. F. Warren et al., 2010).

Based on such evidence that responsiveness mediates child development, many researchers have studied caregiver responsiveness as a component of early ASD intervention (Carter et al., 2011; Green et al., 2015; Green et al., 2013; Karaaslan et al., 2013; Siller et al., 2013). Collectively, the results of these intervention studies are promising. However, as detailed earlier, a family's cultural background could influence how much the family values and adopts such a program. One type of parent-responsiveness intervention, called Responsive Teaching (RT; Mahoney & McDonald, 2007), has demonstrated effectiveness across a range of cultures and languages: in Caucasian families in the US (Mahoney & Perales, 2005), as well as Turkish and Korean families of children with ASD and other developmental disabilities (Karaaslan et al., 2013; Kim & Mahoney, 2005). In a randomized controlled trial with Turkish families, mothers receiving the RT intervention significantly decreased directive behaviors and increased responsive behaviors, while their children significantly increased their social skills, language abilities, and cognition (Karaaslan et al., 2013). These findings suggest that parent-responsiveness interventions, like RT, could be successful in other culturally and linguistically diverse populations, as well.

However, neither RT nor other types of parent-responsiveness interventions have been studied in Hispanic families of children with ASD.

To address this need, this study examined a parent-responsiveness intervention, called Adapted Responsive Teaching (ART) (G. T. Baranek et al., 2015), in primarily Spanish-speaking families living in the US. The purpose of ART is to enhance caregivers' responsiveness to their children and, through these caregiver responses, improve selected pivotal behaviors of their children in the domains of social-communication and sensory-regulatory functioning. ART is based on the RT intervention, and has demonstrated initial success in improving social-communication and decreasing sensory hyporesponsiveness of toddlers at-risk for ASD, as well as decreasing caregivers' use of directive behaviors, but has been only been examined in primarily English-speaking families (G. T. Baranek et al., 2015). The purpose of this study was to investigate the short-term impact of ART in improving the social-communication skills of children with ASD in primarily Spanish-speaking families.

Methods

This study was approved by the Institutional Review Board at the University of North Carolina at Chapel Hill. A single-case multiple baseline across participants and behaviors design was implemented.

Participants and Settings

Participants. The sample for this study included 3 caregiver-child dyads who met the following inclusion criteria: (1) families self-identified as Hispanic and primarily Spanish-speaking (i.e., speak Spanish >50% of the time at home); (2) children met criteria for ASD, as measured by the Autism Diagnostic Observation Schedule (ADOS; Lord et al., 2012); (3) children demonstrated expressive language delays, as measured by the Preschool Language Scale-5—Spanish Edition (i.e., expressive communication standard scores are at least 1.5 standard deviations below the mean) (PLS-5S; Zimmerman, Steiner, & Pond, 2012); (4) children were between 2 – 4 years of age; and (5) children demonstrated problems with social play, as reported by their caregivers and confirmed by the project assessors. Children were excluded from the study if they demonstrated co-morbid genetic or acquired conditions, such as Down syndrome, fragile X syndrome, or hearing loss.

Setting. The caregivers and children were assessed and participated in the intervention in the location of their choosing, such as their home or the research clinic. One family chose to complete the initial assessment in the research clinic, and the other two families chose to complete the initial assessment in their home. The research clinic

had child-sized furniture, toys, and child-friendly pictures on the walls. The intervention sessions for all children occurred in the home. All assessment and intervention sessions were conducted in Spanish.

Procedures

Recruitment. Two families were identified through the Hispanic liaison of the Autism Society of North Carolina. One of these families then recruited a third family whom they had met through participation in the Autism Society of North Carolina. Demographic information for the three participating families is presented in Table 6. Pseudonyms are used to protect the participants' confidentiality. It should be noted that two boys and one girl participated in this study; however, since two of the families were acquaintances, all of the children will be referred to as boys in this paper, including references to siblings, in order to reduce the possibility of deductive disclosure.

Assessment. Once informed consent was received, families participated in the initial assessment. Data was collected on the children's ASD status, expressive and receptive language, and social-communication, as well as on parent responsiveness. Family demographic information was also collected.

Intervention. After completing the initial assessment, families provided additional consent to participate in the ART intervention. First, families participated in a baseline phase, followed by two to three implementation phases, where social-communication behaviors were targeted sequentially until either (a) an intervention effect was achieved for that behavior, and/or (b) 8 sessions had been completed for that behavior. Each family chose a primary caregiver to participate in the intervention with the child, forming a caregiver-child dyad. Other family members could participate, also, but the chosen caregiver was present during all intervention sessions and participated in the parent-child free play videos. This process is described in detail below.

Baseline phase. For the "multiple baseline across participants" portion of the design, families began the intervention at staggered time points, as is consistent with these types of single case studies (Kratowill et al., 2010). Child 1 (Samuel) moved to the first implementation phase immediately after a stable baseline was established, as described below. Child 2 (Luis) was the second child to begin the implementation phase, followed by Child 3 (Camilo).

The baseline phase for all children was as follows: A researcher video-recorded 10-minute parent-child free play sessions in the home. For the free-play sessions, the parent chose a set of materials in the home that were representative of the child's typical play, and was instructed to play with the child as s/he typically did at home.

Table 6

Participant Demographic Characteristics

	Child 1: Samuel	Child 2: Luis	Child 3: Camilo
Family			
Primary parent in ART	Father	Mother	Mother
Languages spoken at home	Spanish & English	Spanish	Spanish & English
Frequency of Spanish with child	>50% of the time, but not always	100% of the time	>50% of the time, but not always
Household income	Missing	Missing	\$35,001 to \$40,000
Public assistance programs	None	Free or reduced lunch at school	Women, Infants, and Children (WIC)
Mother			
Age at entry	31, 32, and 40 years old*		
Race	White	Missing	Missing
Ethnicity	Hispanic or Latino	Hispanic or Latino	Hispanic or Latino
Country of origin	Colombia, Honduras, and Mexico*		
Years in USA	5.5, 12, and 14 years*		
Education	Bachelor's degree	Less than 8 th grade & General Educational Development (GED) test	9 th – 11 th grade
Employment	Not currently working	Not currently working	Not currently working
Father			
Age at entry (years)	32, 38, and 42 years old*		
Race	White	Missing	Missing
Ethnicity	Hispanic or Latino	Hispanic or Latino	Hispanic or Latino
Country of origin	Honduras, Mexico, USA/Mexico*		
Years in USA	5.5 years, 12 years, >18 years*		
Education	Master's degree	Less than 8 th grade	Associate's or 2-year degree
Employment	Full-time employment	Full-time employment	Full-time employment & part-time student
Child			
Age at ART assessment	4 years; 4 months	3 years; 2 months	2 years; 9 months
Age at start of ART treatment	4 years; 5 months	3 years; 4 months	3 years; 1 month
Gender	2 boys and 1 girl* (all children are referred to as "boys" in this paper to reduce the possibility of deductive disclosure)		
Race	White	Missing	Missing
Ethnicity	Hispanic or Latino	Hispanic or Latino	Hispanic or Latino
Country of origin	USA	USA	USA
Years in USA	Whole life	Whole life	Whole life
Time since ASD diagnosis at ART assessment	2 years since ASD diagnosis	1.5 years since ASD diagnosis	6 months since ASD diagnosis

Note. *Summarized across participants to reduce the possibility of deductive disclosure.

The parent was allowed to change the materials from one video to the next, based on his/her judgment about toys and/or objects in which the child was currently interested. The videos were coded for three child pivotal social-communication behaviors targeted in the ART curriculum and confirmed by the family and assessors to be challenging for the child: social play, requesting, and joint attention. The videos were also coded for caregiver use of responsive strategies. The social-communication behaviors were captured for at least 5 data points, until a stable pattern was documented, allowing prediction of the child's future performance (Wendt & Miller, 2012). According to current guidelines, 5 data points is a sufficient for single-case design baselines, provided the participant demonstrates stable and predictable performance (Kratochwill et al., 2010). Samuel completed 5 baseline videos across 2 weeks; Luis completed 7 baseline videos across 9 weeks; and Camilo completed 14 baseline videos across 15 weeks.

Samuel's mother initially chose to be the primary parent in his intervention sessions and free-play videos, and so participated in baseline sessions 1, 2, 3, and 4. After that point, the family decided that the father would be the primary parent participating in the study, and so he completed all subsequent parent-child free play videos. Luis's mother and Camilo's mother chose to be the primary parents to participate in the study with their child.

Implementation phases. Once the children's baselines were stable, the ART intervention was implemented with families according to the ART manual, with the exception of several modifications made to fit the study design. The ART intervention and modifications are described below.

First, the ART intervention was provided in Spanish. Dr. Perales, a collaborator on the team that developed the RT intervention, provided Spanish translations of the RT intervention materials (F. Perales, personal communication, July 23, 2013). Native Spanish-speaking research assistants from Peru and Mexico translated additional ART materials. A second bilingual research team member reviewed these translations to ensure accuracy. It should be noted that the families in the study were from Mexico, Honduras, Columbia, and the United States/Mexico; therefore, the Mexican and Peruvian-Spanish translations may not have fully matched the Spanish dialects of the Honduran and Columbian parents. The interventionist (primary author) was a speech-language pathologist who spoke Spanish fluently as a second language.

At the completion of the baseline phase, the interventionist scheduled intervention sessions in the family's home twice weekly for 60 – 70 minutes per session. Due to cancellations, actual participation was as follows (averaged): (a) Samuel: 1.47 sessions per week; (b) Luis: 1 session per week; and (c) Camilo: 1.89 sessions per

week. At the beginning of each session, a 10-minute parent-child free play session was video-recorded. Parents were provided the same instructions as during the baseline videos. This free-play session is not included in the ART manual, but was included in this study for the purposes of tracking child social-communication behaviors and parent responsiveness. Another modification was that an abbreviated version of ART was implemented due to the shorter duration of the planned intervention. The full ART intervention targets social-communication and sensory-regulatory behaviors (G. T. Baranek et al., 2015); however, only select social-communication behaviors were targeted for this study.

The intervention targets for each child were as follows: (1) Samuel: social play, requesting, and joint attention; (2) Luis: social play and requesting; and (3) Camilo: requesting and social play. For each family, possible intervention targets were discussed prior to each new implementation phase and chosen based on the family's preferences, as well as the child social-communication data. Symbolic play was offered as an intervention target, but no family chose to address this behavior. As a result of these modifications, the general schedule of sessions differed slightly from the manualized version of ART.

Parent Education. In the first 1 – 2 sessions, the interventionist provided parent education. No free play videos were taken in conjunction with the parent education sessions, to allow time for the interventionist and parent to discuss the education materials, build rapport, and discuss the reasons for continuing to record parent-child free play beyond the baseline sessions. In these parent education sessions, the interventionist interviewed the family about their daily routines and primary concerns about their child. After the interview, the family and interventionist jointly decided which social-communication behaviors they would target during the intervention, and during which daily routines and activities.

The interventionist then provided an overview of the ART social-communication content and process, oriented the caregiver to the intervention notebook (which included parent education materials about the program), and answered the family's questions. Next, the interventionist went into more detail about the ART strategies, explaining how the strategies are associated with five dimensions of responsiveness: (1) match (i.e., matching adult behaviors to the child's developmental level, interests, and behavioral style); (2) reciprocity (i.e., engaging in back-and-forth, joint activities with the child); (3) control (i.e., sharing control of the interaction and scaffolding the child's play); (4) contingency (i.e., responding to the child's behavior promptly, frequently, and in a meaningful way); and (5) affect (i.e., demonstrating animation, enjoyment, warmth, and acceptance of the child).

Samuel's father and Luis's mother received 1 parent education session prior to targeting social-communication behaviors, whereas Camilo's mother received 2 parent education sessions. These differences were based on clinical judgment of the parents' need for a second parent education session. As a baseline social validity measure, the caregiver rated the child's skill level with the first social-communication target (Phase 1 target).

Intervention Phase 1: After the parent education sessions, each intervention session proceeded as follows. First, the 10-minute parent-child free play video was recorded. Thus, the first free play video associated with "Phase 1" was taken after the parent education session(s) had been completed, but before the first social-communication target and ART strategies had been introduced. After the free play video, the interventionist introduced 1 – 2 ART strategies that could be used to address the child's first social-communication behavior target (Phase 1 target). Strategies were chosen based on clinical judgment of parent and child needs, parent feedback, and the child's response to the strategy. The interventionist modeled how to use the strategy with the child. The caregiver then practiced using the strategy, while the interventionist provided instruction and support. At the end of each session, the interventionist and caregiver brainstormed how the family could use the strategy at home, before the next session. The interventionist took session notes in Spanish and provided a copy of the notes to the caregiver. In the following session, the parent-child video was recorded, and then the interventionist and caregiver discussed how well the previous strategy or strategies worked during the week. Next, the interventionist introduced 1 – 2 strategies for that day's session, and the session proceeded as described above.

At least 5 data points were gathered while addressing the Phase 1 target, until a treatment effect was observed and/or 8 sessions were administered. The children completed the following number of Phase 1 sessions: (1) Samuel: 7 sessions; (2) Luis: 8 sessions; and (3) Camilo: 8 sessions. After completing this phase, the caregiver completed a second pivotal behavior rating form for the social-communication behavior (Phase 1 target). Once the Phase 1 target was addressed, all children proceeded to the implementation Phase 2 target.

Intervention Phases 2 and 3: The procedures for Phase 2 were the same as described for Phase 1. After Phase 2, Samuel went on to complete Phase 3, while Luis and Camilo ceased the intervention after Phase 2. The second two children completed fewer intervention phases than Samuel due to time constraints and because, according to guidelines for multiple baseline designs, the study provided sufficient opportunities for treatment effects (Kratonchwill et al., 2010). The children completed the following number of Phase 2 and/or Phase 3 sessions: (a) Samuel: 8 sessions in Phase 2 and 8 sessions in Phase 3; (b) Luis: 5 sessions in Phase 2; and (c) Camilo: 8

sessions in Phase 2. Luis's mother declined further sessions after the fifth session of Phase 2 due to undisclosed personal reasons, resulting in an early termination of this phase for Luis. See Table 7 for a list of ART strategies that were taught to the parents in each session. The same strategies could be used to address multiple social-communication targets; when this situation occurred, the clinician and parent discussed how using the strategy differed according to which social-communication behavior was being addressed.

For all families, caregiver fidelity was monitored with a parent implementation rating form, completed by the interventionist after each session. Caregiver responsiveness was monitored by coding the parent-child free play videos for caregiver contingent responses to indications of the child's interest. Child treatment effects were monitored by coding the videos for all three social-communication behaviors. To track interventionist fidelity, a full home visit was video-recorded for 20% of the treatment sessions. A second ART interventionist, not fluent in Spanish, trained a native Spanish-speaking research assistant to complete an ART intervention fidelity checklist, based on the home visit videos. The research assistant and secondary ART interventionist met with the primary ART interventionist as needed to discuss any deviations from the treatment protocol.

Data Collection Methods and Instruments

Initial assessment measures:

- **The Preschool Language Scale-5th edition, Spanish version** (PLS-5S; Zimmerman et al., 2012): This assessment provides standardized information about the auditory comprehension and expressive communication skills of Spanish-speaking children in the US, birth to 7;11 years of age. A trained examiner administered the assessment, which takes about 45 to 60 minutes to complete.
- **The Autism Diagnostic Observation Schedule-2nd edition** (ADOS; Lord et al., 2012): This assessment provides diagnostic information about ASD, and can be used with toddlers to adults. A trained examiner administered the assessment, which takes about 40 to 60 minutes to complete.
- **Demographic Form:** This form was created by the research team, and asked about the following areas: respondent's relationship to child, race/ethnicity, age, education-level, occupation, income level, marital status, family members living at home, family members' level of involvement with childcare, number of siblings, pertinent medical family history, languages spoken at home, and the child's interventions/therapies. This information was collected via caregiver report.

Table 7

ART Strategies Taught to the Families

		ART goals and strategies for family 1			
		Goal 1: Social play	Goal 2: Requesting	Goal 3: Joint attention	
Family 1: Samuel	Sessions	1	<ul style="list-style-type: none"> Communicate without asking questions 	<ul style="list-style-type: none"> Change the environment 	<ul style="list-style-type: none"> Get into my child's world
		2	<ul style="list-style-type: none"> Be more interesting than my child's distractions Turn routines into games 	<ul style="list-style-type: none"> Change the environment Wait silently for a more mature response 	<ul style="list-style-type: none"> Change the environment
		3	<ul style="list-style-type: none"> Take one turn and wait 	<ul style="list-style-type: none"> Communicate without asking questions 	<ul style="list-style-type: none"> Wait silently for a more mature response Communicate the way my child communicates
		4	<ul style="list-style-type: none"> Take one turn and wait 	<ul style="list-style-type: none"> Translate my child's actions, feelings, and intentions into words 	<ul style="list-style-type: none"> Take one turn and wait
		5	<ul style="list-style-type: none"> Play face-to-face games without toys 	<ul style="list-style-type: none"> Communicate the way my child communicates 	<ul style="list-style-type: none"> Communicate less so my child communicates more
		6	<ul style="list-style-type: none"> Play face-to-face games without toys 	<ul style="list-style-type: none"> Give my child frequent opportunities to make choices 	<ul style="list-style-type: none"> Take one turn and wait Change the environment
		7	<ul style="list-style-type: none"> Repeat activities my child enjoys 	<ul style="list-style-type: none"> Give my child frequent opportunities to make choices 	<ul style="list-style-type: none"> Expand to clarify my child's intention or to develop my child's topic Accompany my communications with intonation, pointing, and nonverbal gestures
		8	<ul style="list-style-type: none"> No session 8 	<ul style="list-style-type: none"> Accept incorrect word choice, pronunciations, or word approximations by responding to my child's intention Expand to clarify my child's intention or to develop my child's topic 	<ul style="list-style-type: none"> Change the environment Follow my child's lead
		ART goals and strategies for family 2			
		Goal 1: Social play	Goal 2: Requesting		
Family 2: Luis	Sessions	1	<ul style="list-style-type: none"> Play face-to-face games without toys 	<ul style="list-style-type: none"> Give my child frequent opportunities to make choices 	
		2	<ul style="list-style-type: none"> Follow my child's focus of attention 	<ul style="list-style-type: none"> Change the environment 	
		3	<ul style="list-style-type: none"> Respond to my child in playful ways 	<ul style="list-style-type: none"> Wait silently for a more mature response 	
		4	<ul style="list-style-type: none"> Imitate my child's actions and communications 	<ul style="list-style-type: none"> Get into my child's world Expect my child to interact 	
		5	<ul style="list-style-type: none"> Turn routines into games 	<ul style="list-style-type: none"> Communicate without asking questions Respond quickly to my child's requests 	
		6	<ul style="list-style-type: none"> Be more interesting than my child's distractions Take one turn and wait 	<ul style="list-style-type: none"> No session 6 	

		7	<ul style="list-style-type: none"> • Be more interesting than my child's distractions • Take one turn and wait 	<ul style="list-style-type: none"> • No session 7
		8	<ul style="list-style-type: none"> • Keep my child for one or two more turns than usual 	<ul style="list-style-type: none"> • No session 8
		ART goals and strategies for family 3		
		Goal 1: Requesting		Goal 2: Social play
Family 3: Camilo	Sessions	1	<ul style="list-style-type: none"> • Imitate my child's actions and communications 	<ul style="list-style-type: none"> • Play face-to-face games without toys
		2	<ul style="list-style-type: none"> • Change the environment 	<ul style="list-style-type: none"> • Play face-to-face games without toys • Communicate less so my child communicates more
		3	<ul style="list-style-type: none"> • Change the environment • Respond to unintentional vocalizations, facial displays, and gestures as if they were meaningful conversation 	<ul style="list-style-type: none"> • Match my child's interactive pace • Imitate my child's actions and communications
		4	<ul style="list-style-type: none"> • Respond to unintentional vocalizations, facial displays, and gestures as if they were meaningful conversation • Wait silently for a more mature response 	<ul style="list-style-type: none"> • Expand to show my child the next developmental step • Read my child's behavior as an indicator of interest
		5	<ul style="list-style-type: none"> • Take one turn and wait 	<ul style="list-style-type: none"> • Follow my child's focus of attention
		6	<ul style="list-style-type: none"> • Give my child frequent opportunities to make choices 	<ul style="list-style-type: none"> • Play back and forth with sounds • Respond to my child in playful ways
		7	<ul style="list-style-type: none"> • Communicate without asking questions 	<ul style="list-style-type: none"> • Review of all above social play strategies
		8	<ul style="list-style-type: none"> • Communicate the way my child communicates 	<ul style="list-style-type: none"> • Follow my child's lead

- **The Bidimensional Acculturation Scale for Hispanics (BAS; Marín & Gamba, 1996).** This measure assesses two cultural domains (Hispanic and non-Hispanic) with 12 items per domain, asking about the use of English versus Spanish in a variety of situations (1 “almost never”/ “very poorly” to 4 “almost always”/“very well”). The item scores in each cultural domain are averaged to create a cultural domain score. Scores above 2.5 indicate high adherence to the cultural domain. If both domains are above 2.5, the respondent would be considered bicultural. This measure is available in English or Spanish and was provided to the respondent in his/her preferred language (Spanish for all families).

Baseline & implementation measures:

- **Pivotal Behavior Ratings:** The caregiver rated the child’s skill-level on the targeted social-communication behaviors using a “pivotal behavior rating” form adapted from the RT manual (Mahoney & MacDonald, 2007) for the ART intervention. Targeted social-communication behaviors included social play, requesting, and/or joint attention. The caregiver could choose ratings of “1” (very low skills) to “5” (very high skills) for each social-communication behavior. Definitions were provided to anchor each rating.
- **ART Interventionist Fidelity Checklist (Wakeford & Watson, 2008):** 20% of the intervention sessions were videotaped from beginning to end. A trained research assistant viewed the session videos for the interventionist’s fidelity of implementation, using a rating form adapted from the RT manual (Mahoney & MacDonald, 2007) for the ART intervention. The rating form includes 25 items, which are rated on a scale of 1 (“minimally”) to 7 (“maximally”).
- **ART Parent Implementation Rating Form (Early-Development-Project, 2008):** This form was adapted for the ART intervention based on the RT manual (Mahoney & MacDonald, 2007). The interventionist completed this form after each intervention session, in order to measure parent fidelity of implementation. Parents are rated on 10 items from a scale of 1 (“minimally”) to 7 (“maximally”) using anchored definitions. The form covers the following topics: preparation for the current session; practicing ART strategies between sessions; reflecting on use of ART strategies; actively participating in the session; interacting frequently with the child; asking questions and making comments; practicing new strategies; demonstrating understanding of the intervention strategies; appearing comfortable when using the strategies; and collaborating with the interventionist to create a family action plan.

- **Social-communication coding system:** This coding system was adapted from the Social-Communication Coding Manual (Boyd & Watson, 2012) and the Manual for Coding the Structured Play Assessment (Boyd & Watson, n.d.). Using Observer XT software, two research assistants coded the 10-minute parent-child free play videos in 5-second intervals for the ART social-communication behaviors: social play, requesting, and joint attention. The research assistants coded the videos as they were collected, but were blind to the study design, and so were unaware of the intervention content taught to families. A proportion score was calculated, where the numerator was the number of 5-second intervals in which children used a targeted social-communication behavior, and the denominator was the number of “codable” 5-second intervals (e.g., intervals in which both the child and adult were on camera). The coders were two master’s students in speech-language pathology who were trained to 80% reliability prior to the study.
- **Parent responsiveness coding system:** This coding system was adapted from the Parent Child Free Play coding system, developed by Yoder and colleagues to measure parent responsiveness (P. Yoder & Stone, 2006). Using Observer XT software, two research assistants coded 10-minute parent-child free play videos in 5-second intervals for the following domains: (a) codable or uncodable; (b) child lead or no lead; and (c) parent response, redirection, or no response. Coders also judged whether the parent response was made with “affect” (i.e., at least two of the following characteristics: animation, affection, and/or praise) or “no affect (i.e., less than two of the following characteristics: animation, affection, or praise). If the interval was codable (i.e., parent and child on camera), the coder determined if there was a child lead (i.e., child was paying attention to a referent by touching it or looking at it). If there was a child lead, the coder determined if the parent responded to the child’s referent by playing with the referent (“physical play act”) and/or talking about the referent (“follow-in utterance”). Follow-in utterances could be “directive” (i.e., the parent gave the child an instruction related to the child’s referent) or “non-directive” (i.e., the parent commented about the child’s referent, but did not instruct the child to do anything differently). Physical-play acts included the following behaviors: aiding the child’s action, demonstrating a new action, or imitating the child’s action. The research assistants coded the videos as they were collected, but were blind to the study design, and so were unaware of the intervention content taught to families. A proportion score was calculated, where the numerator was the number of 5-second intervals in which caregivers demonstrated a

response and the denominator was the number of 5-second intervals with a child lead. The coders were two master's students in speech-language pathology, who were trained to 80% reliability prior to the study.

Data Analysis

The two authors independently examined the children's social-communication graphed data to draw conclusions about treatment effects, and then met for consensus about their conclusions. Visual inspection of the data occurred in four steps, based on recent guidelines for analyzing single-case studies (Kratochwill et al., 2010). First, baseline data was examined to document a predictable pattern of social-communication behavior. Next, the implementation phase was examined for changes in level, changes in trend, and variability of the data points. Third, we examined the overlap of data points from one phase to the next, as well as how quickly the data pattern changed across adjacent phases. The change was considered "rapid" if it occurred within six data points (i.e., the last three data points in one phase versus the first three data points of the next phase). The similarity of each implementation phase was also examined (Kratochwill et al., 2010). Fourth, we predicted what the data would look like if the phase were allowed to continue, compared to the patterns that actually occurred. Combined, these four steps allowed documentation of any treatment effects. Treatment effects could occur across behaviors and/or across participants. Three treatment effects and 0 non-effects would indicate strong evidence for the ART intervention. Moderate evidence would be indicated by 3 treatment effects and at least 1 non-effect. Less than 3 treatment effects would indicate no evidence for the ART intervention (Kratochwill et al., 2010).

Results

R version 3.0.2 was used to complete the statistical analyses for coding reliability (The R Foundation for Statistical Computing, 2013). Microsoft Excel 2013 was used to create the graphs for visual analysis.

Initial Assessment

The results from the initial assessment are presented in Table 8.

Reliability of the Social-Communication Coding System (SCCS)

Intraclass correlation coefficients (ICCs) were calculated for 24% of the videos coded with the SCCS, across baseline and intervention phases. The ICC for the three targeted social-communication behaviors were as follows: (a) social-interaction: $ICC(18,19) = 0.69, p < 0.001$; (b) requesting: $ICC(18,19) = 0.86, p < 0.001$; and (c) joint attention: $ICC(18,19) = 0.98, p < 0.001$.

Table 8

Initial Assessment Results

	Child 1: Samuel	Child 2: Luis	Child 3: Camilo
PLS-5 Spanish			
Expressive communication (EC)			
Raw score	24	24	16
Standard score	60	73	54
Percentile rank	1	4	1
Standard deviation (SD)	2 SDs below average	1.5 SDs below average	3 SDs below average
Auditory comprehension (AC)			
Raw score	17	27	18
Standard score	50	61	50
Percentile rank	1	1	1
Standard deviation (SD)	3 SDs below average	2.5 SDs below average	3 SDs below average
Total language score			
Raw score	110	134	104
Standard score	51	65	50
Percentile rank	1	1	1
Standard deviation (SD)	3 SDs below average	2 SDs below average	3 SDs below average
Significant difference between EC & AC?	Yes	Yes	No
ADOS			
Module	1: Some Words	1: Some Words	1: No Words
Social affect (SA)	13	4	16
Restricted and repetitive behavior (RRB)	6	4	6
Total SA & RRB	19	8	22
Cut-off	Autism	Autism spectrum disorder	Autism
Parent BAS			
Parent	Father	Mother	Mother
Hispanic domain score	3.75	3.9	3.5
Non-Hispanic domain score	2.25	1.1	2.4
Level of acculturation (above 2.5)	Hispanic	Hispanic	Hispanic

Note. PLS-5 Spanish = Preschool Language Scale-5 Spanish version; ADOS = Autism Diagnostic Observation Schedule; BAS = Bidimensional Acculturation Scale

Reliability of the Parent Responsiveness Coding System (PRCS)

Intra-correlation coefficients (ICCs) were calculated for 20% of the videos coded with the PRCS, across baseline and intervention phases. The ICC for the PRCS codes were as follows: (a) codable intervals: $ICC(4,5) = 0.78, p = 0.02$; (b) child leads: $ICC(4,5) = 0.80, p = 0.02$; (c) total parent responses (i.e., including physical play and follow-in utterances): $ICC(4,5) = 0.68, p = 0.05$; (d) physical play responses: $ICC(4,5) = 0.64, p = 0.07$; and (e) follow-in utterances: $ICC = 0.69, p = 0.05$. Due to low reliability, the PRCS code of “affect” was not included in further analyses ($ICC = -0.04, p = 0.52$).

Interventionist Fidelity

Interventionist fidelity was calculated for 20% of intervention sessions. The interventionist's average fidelity score was 94.73%, with a range of 90.6% to 99.31%.

Parent Fidelity

Parent fidelity was rated by the interventionist for 100% of the family's intervention sessions. The goal was to achieve a parent fidelity score of at least 80%. The parent fidelity scores were as follows: (1) Parent 1: average of 89.71% with a range of 81.43% to 97.14% (23/23 sessions \geq 80%); (2) Parent 2: average of 79.73%, with a range of 60.71% to 91.43% (7/13 sessions \geq 80%); and Parent 3: average of 88.30% with a range of 77.14% to 95.71% (15/16 sessions \geq 80%). See Table 9 for a session-by-session view of parent fidelity.

Visual Analysis: Social-Communication

All of the social-communication data were examined using recommended guidelines for visual analysis (Kratochwill et al., 2010). The multiple baseline across participants results are presented first, followed by multiple baseline across behaviors.

Multiple Baseline across Participants. The first component of the single-case design was "multiple baseline across participants." To create experimental control, the goal of this design was to establish stable baselines for the behavior, show a change in the behavior from baseline to beginning intervention (i.e., a "treatment effect"), and to replicate that effect across children. The three children participated in the baseline phase, and then began the intervention at staggered time points, beginning with Samuel, followed by Luis, and concluding with Camilo. Visual analysis compared the children's performance to one another to determine if treatment effects were replicated.

Multiple Baseline across Participants: Target 1. Figure 2 presents the social-communication data for each child's first intervention target. For Samuel and Luis, the first target was social-interaction; for Camilo, the first target was requesting. First, visual analysis was completed for the children's Target 1 baseline. For all three children, the baseline occurred at a low level, with an even trend and minimal variability. If the intervention had not been introduced, it seems predictable that all three children's Target 1 behaviors would have continued at this low and steady baseline level.

Intervention began addressing Target 1 in Phase 1. The children's baselines remained stable, even as other children started the intervention phase (i.e., Luis and Camilo's baselines remained stable when Samuel began the

Table 9

Percent Parent Fidelity to Implementation

	Sessions																													
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Parent 1	B	B	B	B	B	91	91	81	91	87	91	86	87	84	86	83	96	93	94	86	94	91	93	93	84	86	97	97	E	
Parent 2	B	B	B	B	B	B	B	61	84	66	84	81	70	76	77	91	76	87	91	91	E									
Parent 3	B	B	B	B	B	B	B	B	B	B	B	B	B	B	93	89	80	86	90	84	86	94	83	80	89	80	93	91	96	77

Note. “B” represents a baseline session and “E” represents the end of participation. Parent fidelity to implementation was calculated using the Parent Implementation Rating Form (Early-Development-Project, 2008). A percentage of 80 – 89 is considered “good” and a percentage of 90 or above is considered “excellent.”

Figure 2. Multiple Baseline across Participants: Target 1

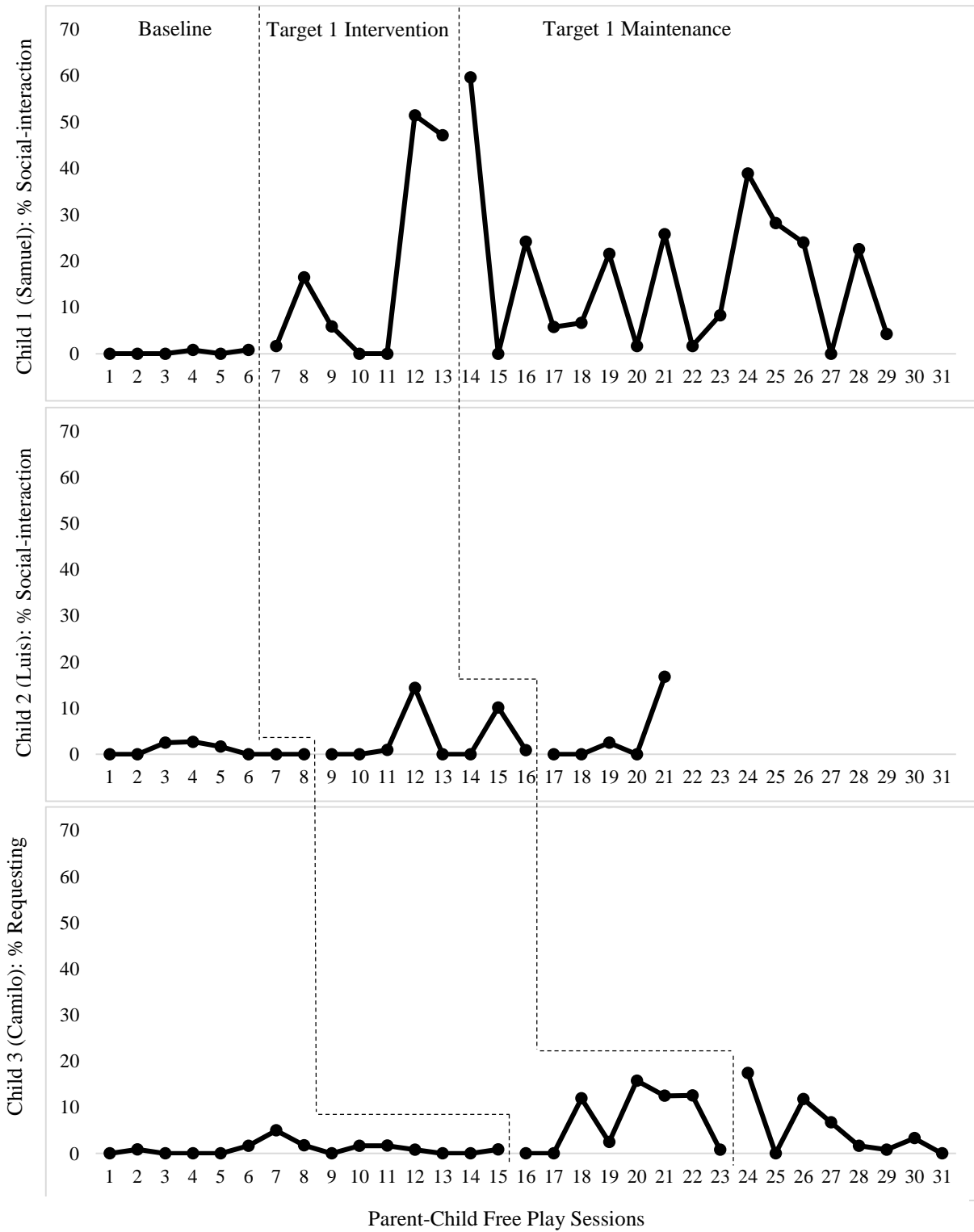


Figure 2. Percent Target 1 social-communication behaviors, demonstrated by the child in free play sessions with a parent, calculated as: (a) number of intervals with the social-communication behavior, (b) divided by number of “codable” intervals, and (c) multiplied by 100. Free play session “1” is the initial assessment.

intervention; Camilo's baseline remained stable as Luis began the intervention). These stable baselines strengthened the evidence that any changes in behavior from baseline to Phase 1 were due to the intervention, rather than extraneous variables. Two children, Samuel and Camilo, demonstrated changes in their Target 1 behavior when they began intervention. Both children's Target 1 data showed an upward trend, a higher level, and wider variability than in baseline. The majority of Samuel's data points (5/7) were higher than baseline, and half of Camilo's data points (4/8) were higher than baseline. For both children, an immediate increase was noted between the last 3 baseline data points and the first 3 Phase 1 data points. If intervention had continued addressing Target 1 as the primary behavior, it seems predictable that these data points would have continued at this higher level. Thus, this visual analysis found a treatment effect for both Samuel and Camilo's Target 1 behaviors.

Luis showed a different behavior pattern for Phase 1 than Samuel and Camilo. When the intervention began in Phase 1, Luis's Target 1 data remained at a low level, although there was a slight upward trend and more variability than at baseline. The majority of the social-interaction data points (6/8) overlapped with baseline. No immediate change in social-interaction occurred between baseline and Phase 1, although there were two brief peaks toward the middle and end of the phase. If intervention were to continue directly targeting social-interaction, it is predictable that the data would have continued at a low level. Thus, no treatment effect was found for Luis's targeted behavior in Phase 1.

Multiple Baseline across Participants: Target 2. Figure 3 presents the social-communication data for each child's second intervention target. For Samuel and Luis, the second target was requesting; for Camilo, the second target was social-interaction. Across all three children, the Target 2 baseline was more variable than the Target 1 baseline; however, overall, the Target 2 baseline occurred at a low and consistent level. If intervention had not addressed Target 2, it is predictable that the children's Target 2 behaviors would have continued at these low levels.

Intervention began addressing Target 2 in Phase 2. As with Target 1, the children's Target 2 behavior maintained a similar pattern throughout baseline, even as other children began Phase 2 of intervention. Both Samuel and Camilo demonstrated changes in their Target 2 behavior at the start of intervention: the behaviors occurred at a higher level than in baseline, with wide variability and an upward trend. For Samuel, the majority of data points in Phase 2 (7/8) overlapped with baseline; however, much of this overlap was due to a brief peak in baseline (session 8). For Camilo, half of the Phase 2 data points did not overlap with baseline (4/8 data points were higher than

Figure 3. Multiple Baseline across Participants: Target 2

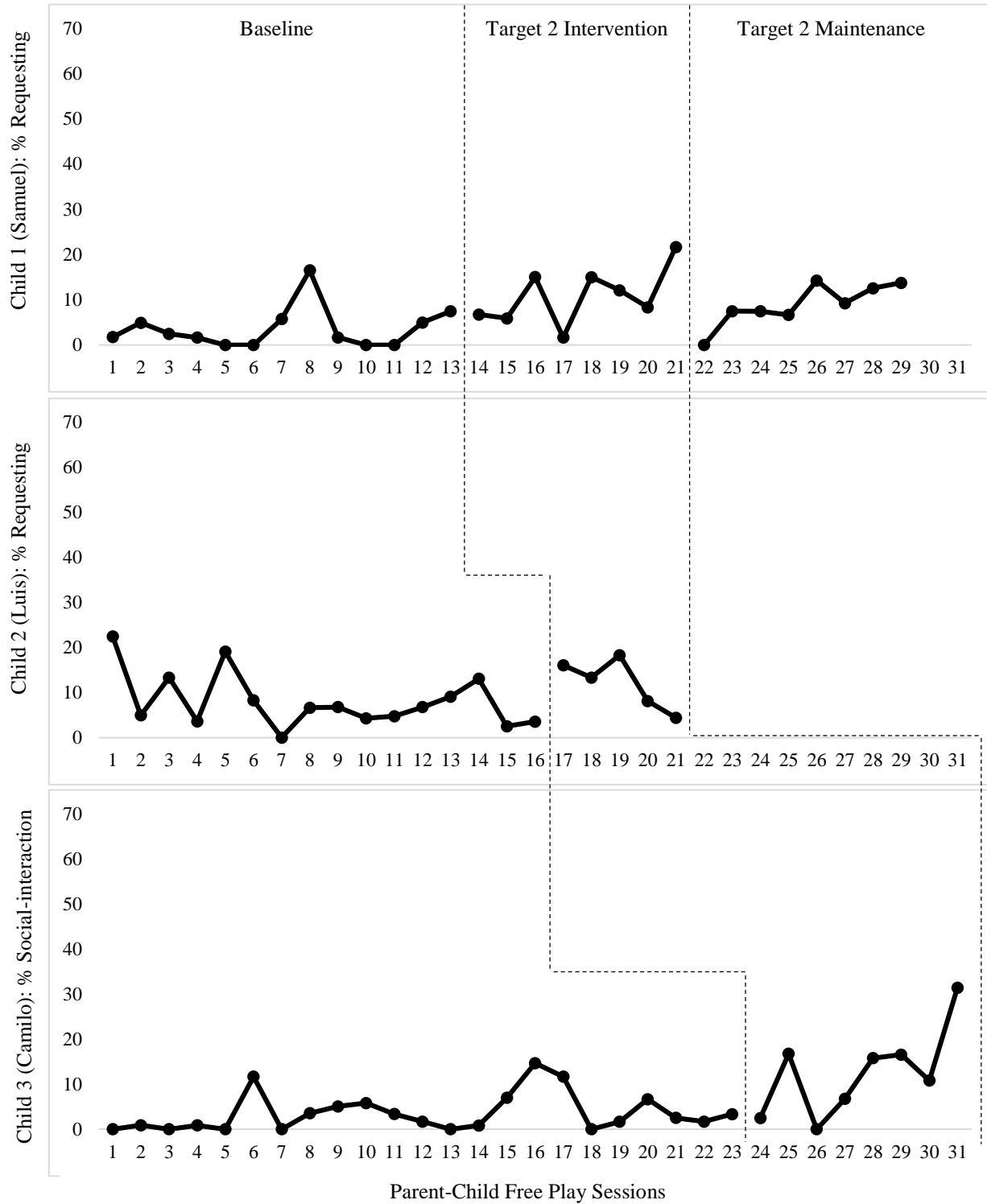


Figure 3. Percent Target 2 social-communication behaviors, demonstrated by the child in free play sessions with a parent, calculated as: (a) number of intervals with the social-communication behavior, (b) divided by number of “codable” intervals, and (c) multiplied by 100. Free play session “1” is the initial assessment.

baseline). With the initiation of Phase 2, there was an immediate change for both Samuel and Camilo, in that the data points start rising and becoming more variable.

The data points continue to increase at the end of Phase 2, suggesting that, if intervention were to continue addressing Target 2, this behavior would have maintained its upward trend. Thus, visual analysis found a treatment effect for Samuel's and Camilo's Phase 2 target behaviors.

Luis's Phase 2 data showed a different pattern than the other children. The Target 2 behaviors had a slightly higher level in Phase 2 than in baseline, with moderate variability and a downward trend. All of the Phase 2 data points (8/8) overlapped with baseline. Therefore, visual analysis revealed no treatment effect for Luis's targeted behavior in Phase 2.

Multiple Baseline across Participants: Target 3. Figure 4 presents the social-communication data for the third intervention target. Samuel was the only child to continue to Phase 3, which targeted joint attention. Luis and Camilo stopped intervention after Phase 2; however, their joint attention was measured for comparison purposes. In Luis and Camilo's baselines, the level, trend, and variability of the data points were fairly stable throughout the study, as would be expected of a non-targeted behavior. Samuel's Target 3 baseline remained at a low and steady level until the last two data points of baseline, where it took an upward trend, corresponding to the completion of Phase 2. It seems possible that, even if intervention had not directly addressed Target 3, these data would have continued in an upward direction.

Intervention began addressing Target 3 in Phase 3. Luis' and Camilo's joint attention baselines did not change, even as Samuel started working on joint attention. During this phase, Samuel's Target 3 level was higher than in baseline, the trend sloped slightly downward, and the variability was wide. All of the Phase 3 data (8/8) overlapped with baseline, although the behavior did not return to 0. Because Samuel's Target 3 began to increase before Phase 3 began, no treatment effect was found for this behavior.

Multiple Baseline across Behaviors. The second component of the single-case design was "multiple baseline across behaviors." To create another level of experimental control, the goal of this design was to establish stable baselines for the target behaviors, show a change in the targeted behavior from baseline to beginning intervention, and to replicate that treatment effect across behaviors. Visual analysis evaluated each child individually, by comparing each targeted behavior to the child's other targeted behaviors.

Figure 4. Multiple Baseline across Participants: Target 3

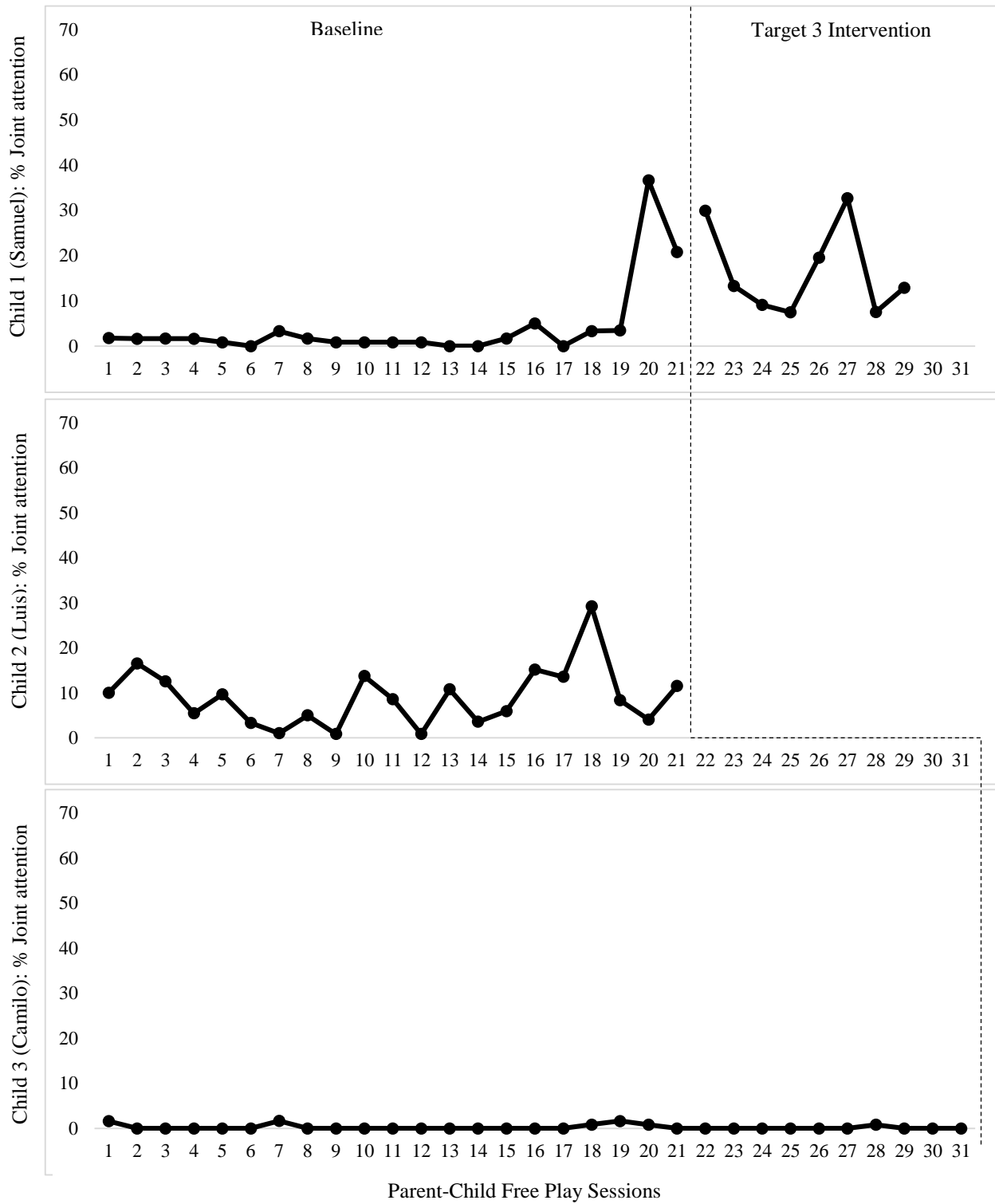


Figure 4. Percent Target 3 social-communication behaviors, demonstrated by the child in free play sessions with a parent, calculated as: (a) number of intervals with the social-communication behavior, (b) divided by number of “codable” intervals, and (c) multiplied by 100. Free play session “1” is the initial assessment.

Multiple Baseline across Behaviors: Child 1 (Samuel). Figure 5 presents the social-communication data for Samuel, which includes the target behaviors for his three implementation phases: Target 1 (social-interaction), Target 2 (requesting), and Target 3 (joint attention). The social-interaction baseline was very stable, demonstrating a low, even trend with minimal variability. In comparison, the requesting baseline was somewhat variable, but had a low level and even trend. The variability was due to one brief peak in requesting (session 8), corresponding to the start of Phase 1, when intervention began targeting social-interaction. After this peak, the data quickly returned to a low and consistent level. If intervention had not addressed social-interaction and requesting, it seems predictable that these behaviors would have continued at these low levels. The joint attention baseline was different than the first two targets. At first, joint attention occurred at a low and steady level, but the data showed an upward trend in the last 2 baseline sessions, corresponding to the end of Phase 2, when intervention was targeting requesting.

Intervention began addressing social-interaction in Phase 1, followed by requesting in Phase 2, and concluding with joint attention in Phase 3. During their respective implementation phases, Samuel's social-interaction and requesting both showed an upward trend, a higher level, and more variability when compared to baseline. Social-interaction increased more dramatically than requesting, although requesting showed a small increase and never returned to 0, as it did in baseline. The majority of Samuel's social-interaction data points were higher during the implementation phase than in baseline (5/7 were higher than baseline), whereas the majority of requesting data points during implementation overlapped with baseline (7/8 overlapped with baseline); however, as noted above, much of this overlap was due to one brief peak in the requesting baseline. For both social-interaction and requesting, there appears to be an immediate change between the last 3 baseline data points and the first 3 data points of intervention. If the intervention had continued targeting social-interaction and requesting as the primary behaviors, it seems predictable that the data points would have continued in an upward direction. Thus, visual analysis found a treatment effect for Samuel's social-interaction, and a small treatment effect for Samuel's requesting.

Samuel's joint attention showed a different pattern than the other two targets. In Phase 3, the joint attention level was higher than baseline, the trend sloped slightly downward, and the variability was wide. All of the joint attention data in Phase 3 (8/8) overlapped with baseline. Because joint attention began to increase before Phase 3 began, no treatment effect was found for this behavior.

Figure 5. Multiple Baseline across Behaviors: Child 1 (Samuel)

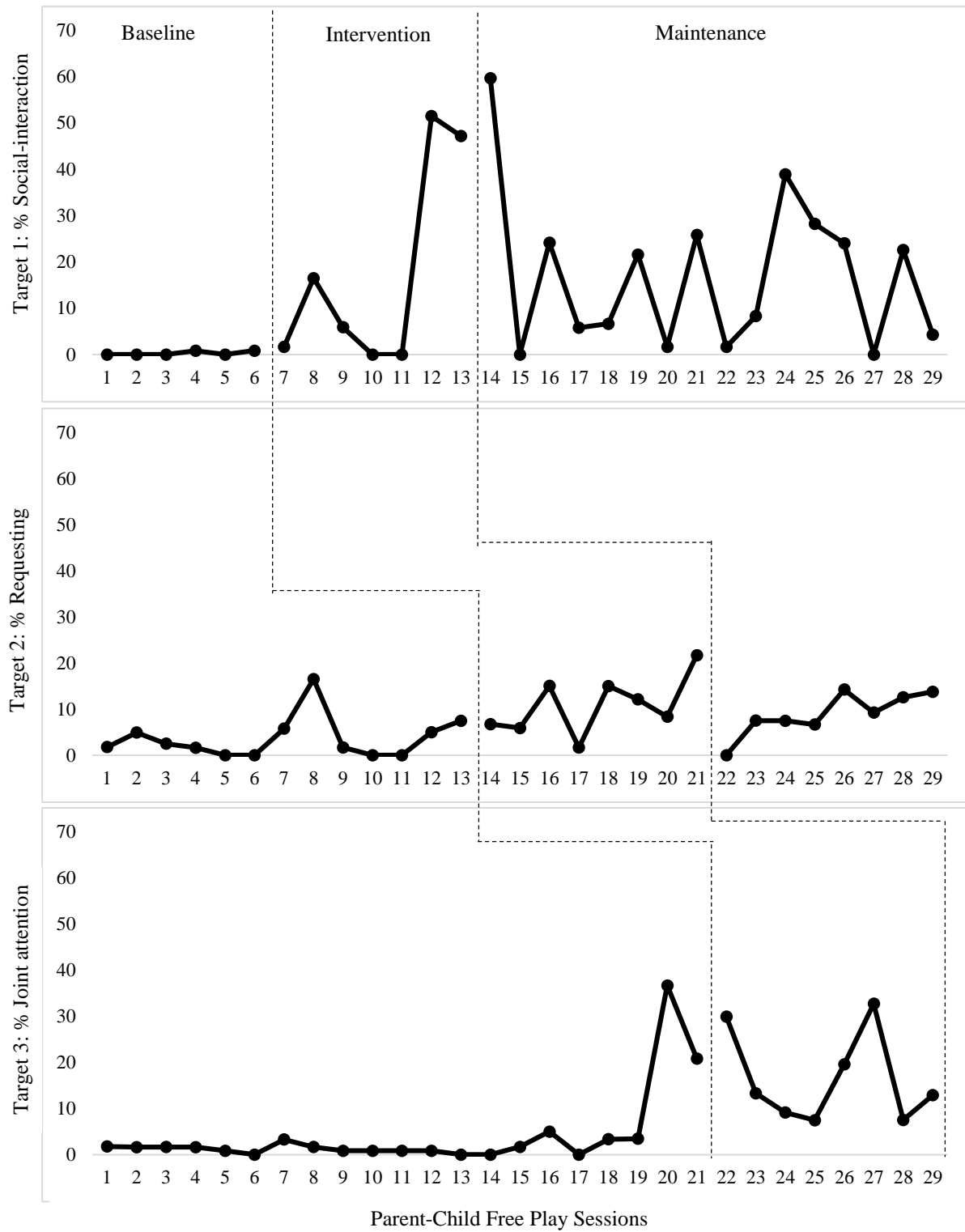


Figure 5. Percent social-communication behaviors demonstrated by Child 1 (Samuel) in free play sessions with a parent, calculated as: (a) number of intervals with the social-communication behavior, (b) divided by number of “codable” intervals, and (c) multiplied by 100. Free play session “1” is the initial assessment.

Multiple Baseline across Behaviors: Child 2 (Luis). Figure 6 presents the social-communication data for Luis, which includes the target behaviors two implementation phases: Target 1 (social-interaction) and Target 2 (requesting). Joint attention was never targeted, and so is presented as a baseline behavior. First, visual analysis examined the baselines for these behaviors. Luis's social-interaction baseline was low, with a fairly even trend and minimal variability. His requesting and joint attention baselines occurred at a higher level and were more variable than the social-interaction baseline, but the trends were also fairly steady across baseline. Without directly targeting these three behaviors, they likely would have demonstrated similar patterns over time.

Intervention began targeting social-interaction in Phase 1, followed by requesting in Phase 2. The social-interaction data remained at a low level, although there was a slight upward trend and some variability. The majority of the social-interaction data points in Phase 1 (6/8) overlapped with baseline. No immediate change in social-interaction occurred between baseline and Phase 1, although there were two brief peaks toward the middle and end of the phase. In contrast, requesting showed an immediate change between the last 3 data points in baseline and the first 3 data points in Phase 2, in that the behavior increased to a higher level; however, the data moved in a downward trend for the rest of Phase 2. Additionally, all of the requesting data points in Phase 2 (8/8) overlapped with baseline. If intervention were to continue directly targeting social-interaction and requesting, it seems predictable that the data would have continued at these low levels. Thus, there clearly was no treatment effect for either of Luis's targeted behaviors.

Multiple Baseline across Behaviors: Child 3 (Camilo). Figure 7 presents the social-communication data for Camilo, which includes the target behaviors for the child's two implementation phases: Target 1 (requesting) and Target 2 (social-interaction). Camilo's joint attention was never targeted, and so is presented as a baseline behavior. Camilo's requesting and joint attention baselines occurred at a low level, even trend, and minimal variability. The social-interaction baseline also occurred at a low level, but showed a slight upward trend and somewhat more variability than the other two behaviors, particularly because of a brief peak in session 6, just before requesting was addressed, and in sessions 16 and 17, when requesting was first addressed. After each of these brief peaks, the social-interaction baseline then returned to a low and consistent level. Without directly targeting requesting, social-interaction, or joint attention, it is predictable that each behavior would have continued at these low levels.

Figure 6. Multiple Baseline across Behaviors: Child 2 (Luis)

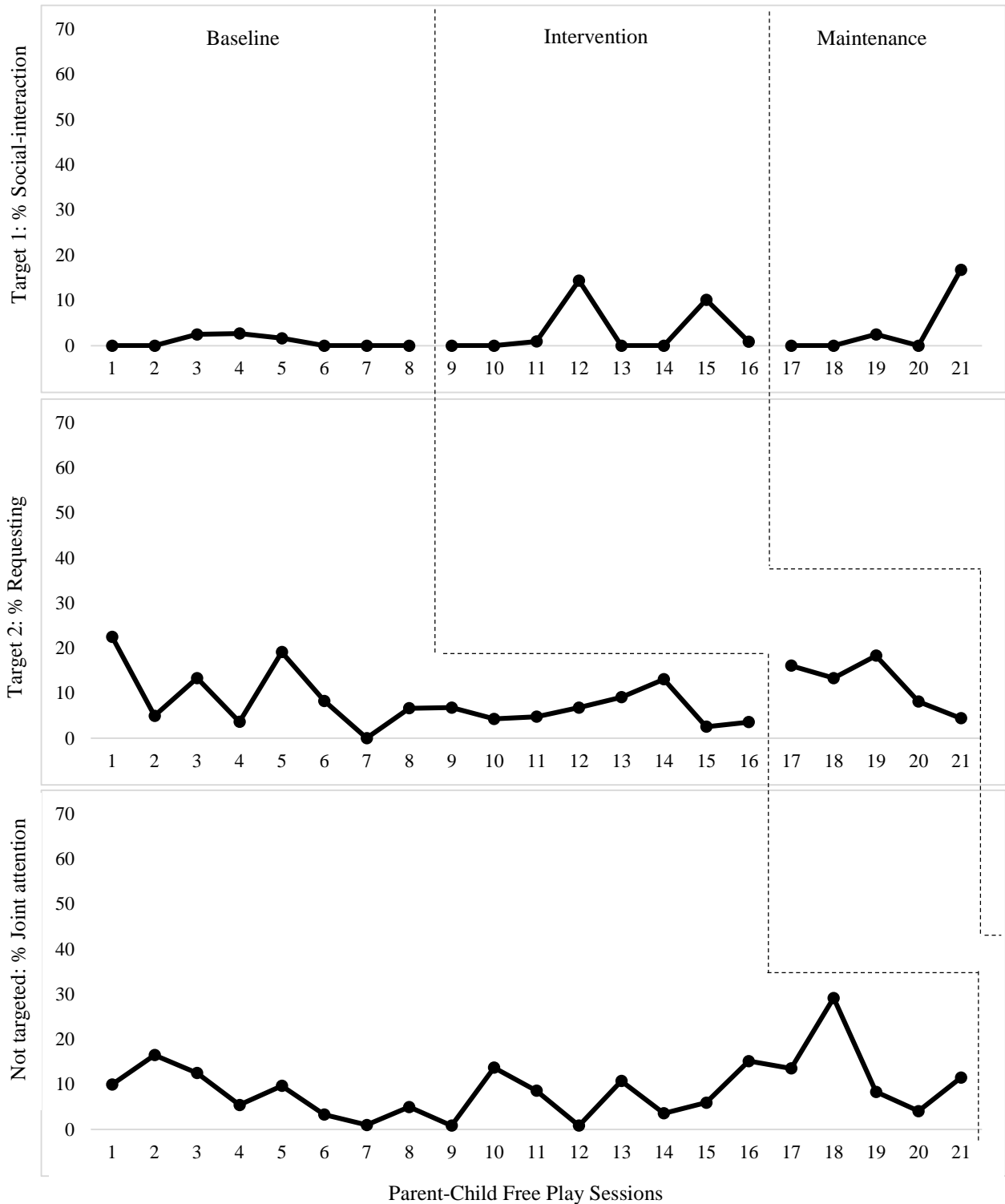


Figure 6. Percent social-communication behaviors demonstrated by Child 2 (Luis) in free play sessions with a parent, calculated as: (a) number of intervals with the social-communication behavior, (b) divided by number of “codable” intervals, and (c) multiplied by 100. Free play session “1” is the initial assessment.

Figure 7. Multiple Baseline across Behaviors: Child 3 (Camilo)

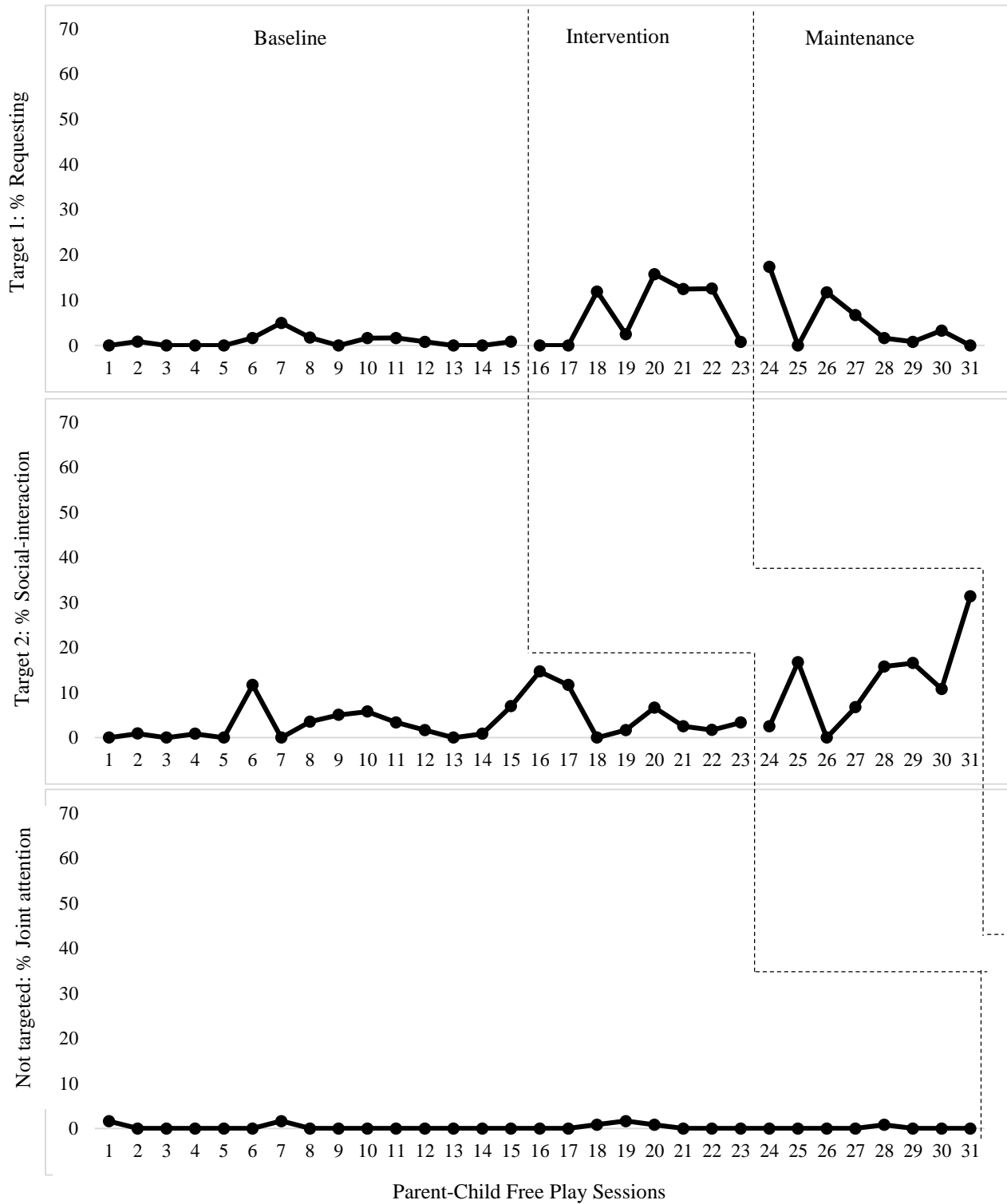


Figure 7. Percent social-communication behaviors demonstrated by Child 3 (Camilo) in free play sessions with a parent, calculated as: (a) number of intervals with the social-communication behavior, (b) divided by number of “codable” intervals, and (c) multiplied by 100. Free play session “1” is the initial assessment.

Intervention began targeting requesting in Phase 1, followed by social-interaction in Phase 2. Other than the brief peaks in social-interaction, Camilo's requesting, social-interaction, joint attention remained stable throughout baseline, even as other behaviors were being targeted. This stable baseline created strong evidence that, if any changes occurred at the start of intervention, they were due to the treatment rather than other variables. When compared to baseline, both requesting and social-interaction occurred at higher levels when intervention began targeting them; these behaviors also showed an upward trend, and wide variability. Half of the data points for requesting in Phase 1 (4/8) and for social-interaction in Phase 2 (4/8) were higher than baseline data points. An immediate change occurred between the last 3 points of baseline and the first 3 points of each implementation phase, in that requesting and social-interaction started to increase. If intervention had continued to address requesting and social-interaction as primary behaviors, it seems predictable that these behaviors would have continued at these higher levels. Thus, visual analysis found treatment effects for both of Camilo's targeted behaviors: requesting and social-interaction.

Determination of Evidence. In summary, visual analysis of the multiple baselines across participants component of the design found treatment effects for two out of three children, and these two children demonstrated treatment effects for the same two behaviors. Specifically, Samuel demonstrated treatment effects social-interaction and requesting, but not joint attention (2 out of 3 targeted behaviors), and Camilo replicated these treatment effects for requesting and social-interaction (2 out of 2 targeted behaviors). Luis demonstrated no treatment effects for either social-interaction or requesting (0 out of 2 targeted behaviors). In the analysis of the multiple baselines across behavior component of the design, visual analysis revealed 4 treatment effects out of 7 targeted behaviors. The stable baselines across children and behaviors support this conclusion. According to What Works Clearinghouse guidelines for single-case designs, three treatment effects and at least one non-effect is considered moderate evidence for intervention efficacy (Kratochwill et al., 2010). Therefore, moderate evidence has been demonstrated for the ART intervention's effect on social-communication behaviors.

Parent Responsiveness

Parent responsiveness probes were completed for 26% of the parent-child free play videos. The parent responsiveness data were gathered to provide a picture of how parents responded to their children over time. This study was not designed to examine parent behaviors as outcome variables, and so these data were not visually examined using the procedures for single case design analysis, as was done for the children's social-communication

data (Kratochwill et al., 2010). Instead, a table and descriptions of the data are provided. Table 10 presents the parent responsiveness data for each parent. Across all parents, follow-in utterances occurred more frequently than physical play acts.

Table 10

Parent Responsiveness

	Probe 1	Probe 2	Probe 3	Probe 4	Probe 5	Probe 6	Probe 7
Parent 1: Samuel's father	Baseline 75.45%	Baseline 73.91%	ART 78.15%	ART 74.55%	ART 79.46%	ART 62.28%	N/A
Parent 2: Luis's mother	Baseline 87.29%	Baseline 83.90%	Baseline 67.80%	Baseline 68.13%	ART 41.62%	ART 46.25%	ART 56.14%
Parent 3: Camilo's mother	Baseline 56.36%	Baseline 66.07%	Baseline 85.47%	Baseline 56.67%	Baseline 28.97%	ART 36.13%	ART 84.35%

Note. Total parent responses demonstrated by the parent in 10-minute free play sessions with his/her child. Parent responses are calculated as: (a) number of intervals with the parent response behavior (i.e., follow-in utterance and/or physical play act); (b) divided by number of intervals with a child lead (including intervals where the child is adopting a parent lead); and (c) multiplied by 100.

It should be noted that Samuel's family decided to change which parent primarily participated in the intervention sessions. Therefore, the father participated in the assessment (labeled as session "1" in Figures 3.1 – 3.4), the mother participated in the first four baseline sessions (labeled as sessions "2, 3, 4, and 5" in Figures 3.1 – 3.4), and the father participated in all subsequent intervention sessions (labeled as sessions "6" and onward in Figures 3.1 – 3.4). For this family's parent responsiveness data, only the father's sessions were included in the results.

As shown in Table 10, Samuel's father demonstrated relatively high and consistent responsiveness to his child over time. His mean total responsiveness was 74.0%, with a range of 62.3% to 79.5%. In contrast, Luis's mother demonstrated more variability in her responsiveness, which tended to decrease over time. Her mean total response was 64.5%, with a range of 41.7% to 87.3%. The downward trend appeared to level off when intervention started and slowly rise upward. For Camilo's mother, responsiveness ranged from a low of 29% to a high of 85.5% across 4 baseline probes with no consistent pattern; her responsiveness was low during the first intervention probe (36.1%) and then rose back to 84.4% in the second (and final) intervention probe. Her average responsiveness was 59.2%

Social Validity

Parents completed pivotal behavior rating forms directly before (i.e., "Time 1") and after (i.e., "Time 2") targeting each social-communication behavior in ART. For 6 out of 7 behaviors, Time 2 ratings were completed without first reviewing Time 1 ratings; this was encouraged so that parents would not base their current scores on

the initial ratings, but rather on the rating definitions associated with each number. However, parents had copies of the ratings in their ART binder, and prior to rating one of the targeted behaviors post-intervention, a parent viewed the initial ratings first.

Parent 1: Samuel's father. For all social-communication targets, Samuel's father perceived a 1 point improvement after addressing each behavior in ART, going from a rating of "2" to "3" for each behavior: social play, requesting, and joint attention. Time 2 social play was rated after the father reviewed the Time 1 rating.

Parent 2: Luis's mother: For both social-communication targets, Luis's mother perceived a 1 point improvement after addressing the behaviors in ART, going from a rating of "2" to "3" for both social play and requesting.

Parent 3: Camilo's mother: For requesting, Camilo's mother perceived a 4 point improvement after addressing this behavior in ART, going from a rating of "1" to "5." For social play, the mother reported that Camilo had varying abilities, depending on the person in the interaction. Therefore, she rated his social play skills two times, once for Camilo's interactions with his mother and older brother, and once for his interactions with his father and others outside the family. She perceived a 2 point improvement in Camilo's interactions with his older brother and herself, going from a rating of "3" to "5." She perceived a 1 to 2 point improvement in Camilo's interactions with his father and others outside the family, going from a rating of "1" to "2 – 3." She viewed this improvement as inconsistent, changing between a "2" and a "3" at various times.

Discussion

Researchers have long speculated that early intervention programs may clash with the belief systems and caregiving styles of families from culturally and linguistically diverse (CLD) families, since these intervention programs have been developed around mainstream parenting techniques (van Kleeck, 1994; Westby, 2009). In addition, disparities in ASD services have widely been reported for Hispanic families of children with ASD (e.g., Magaña et al., 2012; Parish et al., 2012; Thomas, Ellis, McLaurin, Daniels, & Morrissey, 2007; Zuckerman et al., 2014). Collectively, this research reflects the lack of culturally-relevant services for Hispanic families, and highlights an urgent need to find ASD intervention programs that are successful within diverse cultures. To our knowledge, however, no previous study has investigated the success of parent-mediated interventions for Hispanic families of children with ASD. To address this need, we examined the impact of a parent-mediated intervention,

Adapted Responsive Teaching (ART) (G. T. Baranek et al., 2015), on the social-communication behaviors of toddlers and preschoolers with ASD from primarily Spanish-speaking families.

The results of this study partially confirmed our hypothesis that, after participating in ART, children would demonstrate improved social-communication skills. Treatment effects were demonstrated in: (a) two out of three children, and (b) four out of seven targeted behaviors, providing moderate evidence in support of the ART intervention. Specifically, two out of three children increased their communication for the functions of social-interaction and requesting. One child received intervention for joint attention and initiated more joint attention after participating in ART; however, this change occurred before the behavior was directly targeted, and so the improvement was not considered a treatment effect.

The three parents also rated their child's social-communication behaviors as improved after ART, including skills that did not demonstrate treatment effects with the coding system. The social validity results below should be interpreted with caution, however. Most of the parents' post-intervention ratings were completed without reviewing the initial ratings, so that parents could provide an opinion based on their child's current functioning, rather than simply marking a higher score than was put originally. Nonetheless, the parents were not blind to their child's intervention targets, and so they may have rated their child's behavior at a higher level because they expected or desired to see these changes. It is also possible that the children demonstrated improvements that were not captured by the coding system, but that felt significant to the parents.

Parent behaviors were also probed throughout the study, capturing a picture of how parents responded to their children over time. The first parent showed consistently high levels of responsiveness across baseline and the intervention; the second parent decreased responsiveness across baseline, but seemed to plateau when the intervention began; and the third parent also showed variable responsiveness across the probes, with one peak in responsiveness occurring during baseline and one in the last intervention probe. Overall, these patterns are not entirely consistent with what we would expect after participation in ART, since the purpose of ART is to increase or maintain high levels of parent responsiveness. Although the first parent showed a sustained high level of responsiveness that may have been supported by ART, it is difficult to interpret the responsiveness data for the second and third family in relation to the intervention. It is important to remember that the responsiveness coding system only reliably measured one aspect of responsiveness: the parents' contingent responses to their child's interests (i.e., talking about and/or playing with their child's interests). This coding may have failed to capture

parents' use of other strategies that they practiced during the ART program (e.g., "be more interesting than my child's distractions").

For the two children and parents who demonstrated positive outcomes after ART, these findings extend previous literature, in which parent-mediated interventions have been successful in improving outcomes in CLD families. For example, the Responsive Teaching (RT) intervention improved parent responsiveness and child social-communication skills among Turkish and Korean families of children with ASD and other developmental disabilities (Karaaslan et al., 2013; Kim & Mahoney, 2005). To provide greater understanding of the results, we discuss the treatment effects and non-effects in more detail below, as they relate to parent and child characteristics. Implications about acceptability of the intervention are also discussed. First, however, we present the study's limitations, which are important to consider when interpreting the results.

Limitations

Single-case designs are strong methods for examining intervention effects, and are of particular benefit when studying heterogeneous populations, such as culturally and linguistically diverse children with ASD. In these designs, however, reduced internal validity is a possible limitation. Replication is the most important protection against this threat (Baer, 1977; Horner et al., 2005; Kratochwill et al., 2010; Odom et al., 2005). If an intervention effect is demonstrated repeatedly across multiple phases, many threats to internal validity can be ruled out, suggesting that changes in child behavior were due to the intervention, rather than extraneous variables. Based on What Works Clearinghouse criteria for multiple baseline designs, the current study included at least 6 phases with at least 5 data points per phase, helping to reduce internal validity threats (Kratochwill et al., 2010). The fact that the children's baselines remained stable, even while the intervention was being implemented for other children and/or behaviors, provides strong evidence that any changes across phases occurred due to the intervention, rather than other variables. Visual inspection also carries limitations, since conclusions about intervention effects could differ, depending on the person analyzing the results (Cakiroglu, 2012). To strengthen the visual analysis process, both authors examined the data separately and met to discuss their conclusions, basing their analysis on What Works Clearinghouse guidelines for visual analysis (Kratochwill et al., 2010).

Another potential limitation to note is that, for Child 1, the family decided to change which parent would primarily participate in the free play sessions while still in the baseline phase. Thus, the mother completed four baseline videos with the child (sessions 1, 2, 3, and 4) and the father participated in the free play session during the

initial assessment, and at the end of the baseline period, and throughout the implementation phases (sessions 0, 5, and 6 to 28). It is possible that the child would demonstrate different patterns of social-communication with his mother than with his father, rather than showing different behaviors because of the intervention, per se. However, the child's behavior changes coincided with each intervention phase, rather than with the change in parents, suggesting that this child's data are valid representations of his response to treatment.

A final consideration before discussing the results is the generalizability of the data. All three families identified as Hispanic and primarily Spanish-speaking, and represented different cultures from most of the previous research on this topic. Nonetheless, these families clearly do not represent a homogeneous group or culture; each family came to the US from different countries and brought their own cultural beliefs to the treatment. Thus, the results should not be generalized to one, homogenous "Hispanic culture," but should be viewed in terms of each family's unique characteristics. Indeed, detecting individual differences in each family's performance is a strength of single-case design, when compared to randomized control trials (Horner et al., 2005; Kratochwill et al., 2010). Therefore, although the results are not generalizable to a large population, the children's performances could guide decision-making about early intervention, based on whether families seeking intervention share similar characteristics to the parents and children in this study. In addition, the results could potentially provide a starting point for future intervention studies with Spanish-speaking families of children with ASD. Below, we examine the participants' performances in detail.

Treatment Effects: Samuel and Camilo's Social-Interaction and Requesting

Two children, Samuel and Camilo, demonstrated treatment effects for both social-interaction and requesting. Samuel also maintained social-interaction and requesting during subsequent phases. This performance suggests that Samuel's skills were fairly established in his repertoire and/or that his family continued to address these skills in subsequent phases, along with the new communication targets. Camilo also continued to demonstrate his requesting for a time in the next intervention phase, before decreasing back to lower levels. Camilo may have needed additional focus on requesting in order to establish this skill in his repertoire. The issue of maintenance is important to address in future research: At what point do children maintain their gains without the need for further intervention? The hope is that, since the children's parents were the primary interventionists in ART, they would continue addressing these behaviors, allowing the children more time to strengthen their skills. This expectation for

the parents raises a second question for future research: At what point do parents internalize these responsive teaching strategies without the need for further coaching?

In addition to skill maintenance, another issue to consider is whether Samuel and Camilo's treatment effects carry practical significance. We can begin to address that question by comparing the participants' performance to that of typically developing children. A summary compiled by Paul and Norbury (2012), documents the frequency of communication acts for typically developing children aged 18 – 24 months. The summary does not provide an entirely accurate comparison for the participants in the current study, given that our participants were older than 24 months when the study began (33 – 52 months) and came from culturally and linguistically diverse backgrounds. Furthermore, the Paul and Norbury (2012) summary includes communication responses, as well as initiations, whereas the current study only measured initiations. Nevertheless, comparing the children's performance to this summary provides at least some insight into how frequently the participants were communicating when compared to typically developing peers.

According to Paul and Norbury (2012), children ages 18-to-24 months typically communicate 7.5 times for every minute of free play, or 75 communication acts per 10-minutes of free-play. For this study, coders looked for one communication act every 5 seconds of a 10-minute free-play video, resulting in 120 possible communication acts ($[120 \text{ communication acts} / 120 \text{ 5-second intervals}] * 100 = 100\%$). If the participants were communicating as frequently as described in Paul and Norbury's (2012) summary, then they would have produced communication acts in 62.5% of the 5-second intervals ($[75 \text{ communication acts} / 120 \text{ 5-second intervals}] * 100 = 62.5\%$).

To compare the participants' performance to the summary data, we totaled all communicative acts (i.e., social-interaction, requesting, and joint attention) to create one comparison score. According to this total score, Samuel produced communicative acts as follows: (1) Baseline: average of 3.32% (range of 0.83% to 6.55%); (2) Phase 1: average of 24.25% (range of 0.83% to 57.29%); (3) Phase 2: average of 37.82% (range of 7.43% to 68.28%); and (4) Phase 3: average of 41.47% (range of 29.11% to 57.82%). Thus, from baseline to intervention, Samuel's range of communicative acts reached the level expected of a typically developing 18- to 24-month-old (62.5%). The frequency of Camilo's communication acts was as follows: (1) Baseline: average of 3.88% (range of 0% to 13.3%); (2) Phase 1: average of 12.70% (range of 4.16% to 23.25%); and (3) Phase 2: average of 17.87% (range of 11.76% to 31.35%). Unlike Samuel, Camilo never reached the level of communication expected for a toddler. However, he did show steady progress over the course of the intervention phases and his steady progress

over time suggests that, if the intervention were to continue, he might have eventually reached that level. These conclusions are tentative, given the incongruity between Paul and Norbury's (2012) summary data and the demographics of our participants. At times, Samuel may have communicated as frequently as a 1-to-2 year old, but without further comparison data, it is unclear whether he communicated as frequently as other 4-year-olds. Future research should examine frequency of communication in older children who are typically developing, both from monolingual and bilingual backgrounds.

Non-Effect: Samuel's Joint Attention

Samuel was the only child to participate in a third treatment phase, focusing on initiation of joint attention. He did show improvements in joint attention, but this increase occurred before joint attention was directly targeted, and so was not considered a treatment effect. Important to note, however, is the fact Samuel frequently initiated joint attention throughout Phase 3, when joint attention was being targeted, and did not return to baseline levels. It is possible that gaining skills in social-interaction and requesting created the foundation for Samuel to start developing joint attention before it was directly targeted in therapy, and that focusing on joint attention during Phase 3 helped maintain this increase. This speculation is supported by past research, which has demonstrated that, in typical development, social-interaction and requesting develop earlier than joint attention (E. Crais, Douglas, & Campbell, 2004).

Non-Effects: Luis's Social-Interaction and Requesting

Contrary to Samuel and Camilo, Luis showed no treatment effects for social-interaction or requesting, despite producing more requesting and joint attention behaviors at baseline than the other two children. Importantly, Luis did demonstrate skills in each domain of social-communication, and his mother showed high responsiveness and fidelity during some of the sessions. She also rated his social-communication skills as improved after participating in ART. For example, Luis produced minimal social-interaction during baseline, but showed two brief increases during the first intervention phase, when social-interaction was targeted, and again during the second intervention phase. It is possible that these increases were related to the ART intervention, particularly since Luis demonstrated very minimal social-interaction during baseline, but the increases were not consistent enough to be considered an intervention effect. There are several possible reasons for this limited progress, which we discuss below.

Intervention fidelity and responsiveness. Differences in the parents' intervention fidelity and responsiveness may be related to the children's differential outcomes, since ART is designed to improve child outcomes through parent responsiveness (G. T. Baranek et al., 2015). Of note, the parents of the two children with treatment effects (Samuel and Camilo) demonstrated 80% or greater treatment fidelity for the majority of intervention sessions, whereas the parent of the child with no treatment effects (Luis) demonstrated less consistent fidelity to intervention. To achieve high fidelity, parents reported that they regularly practiced between sessions, demonstrated understanding of the content, and actively participated during sessions in a variety of ways. These parents' intervention fidelity likely contributed to the children's progress in social-communication. In addition to parent fidelity, parent responsiveness (i.e., how frequently parents responded to their child's interest during free-play videos) could have related to the children's outcomes. However, the parent responsiveness data should be interpreted with caution, since these behaviors were not coded in every parent-child free play video. It is possible that lower levels of parent responsiveness related to Luis's inconsistent levels of social-communication, but this relationship is unclear without further data.

Intervention intensity. Another likely explanation for Luis's limited progress is the number and frequency of Luis's treatment sessions. Due to family cancellations, Luis participated fewer intervention sessions per week and fewer intervention sessions total, when compared to Samuel and Camilo. These lower intensity levels could have contributed to Luis's minimal progress, as well as his parent's inconsistent fidelity to treatment.

Child baseline abilities. In past studies, children with higher initial levels of expressive language (Siller et al., 2013) and object interest (Carter et al., 2011; P. Yoder & Stone, 2006) did not benefit as much from parent-responsiveness interventions as children with low initial expressive language and object interest. Siller and colleagues (2013) suggest that children with higher developmental skills may benefit from programs with higher intensity and/or programs that focus on different subtypes of parent responsiveness, tailored to address the children's more advanced skills. This suggestion is interesting in the case of Luis, who not only had higher initial language levels than the other participants, but also received ART at a lower intensity. It is possible that a combination of these factors contributed to Luis's lack of treatment effects.

Acceptability of ART. Luis's limited progress raise questions about ART's acceptability for this family. The lower intensity and fidelity levels could be related, in part, to the family's perceptions of the ART program and whether they find it valuable and practical to implement. This topic is particularly relevant in light of health

disparities research (e.g., Zuckerman et al., 2014), and due to speculations that parent-implemented interventions may clash with parenting styles and beliefs of culturally diverse families (van Kleeck, 1994, 2013). A qualitative study was completed with these parents after their participation in ART to explore these issues further. The results are presented in a separate paper (see Kinard & Watson, in preparation-a), but a brief discussion of acceptability is warranted here.

Research indicates that parents choose interventions for their children based on a variety of factors, such as child traits, parental traits, and qualities of the intervention program (Hebert, 2014). For example, parents may choose certain intervention programs based on whether the treatment strategies go along with their parenting style (Hebert, 2014). It is possible that aspects of ART did not match or fully support the characteristics of Luis's families. The three families shared many similarities, but also differed on several characteristics, which may provide clues to differences in parent uptake of the intervention.

First, acculturation to the mainstream culture may have influenced intervention fidelity. Both Samuel and Camilo's families primarily spoke Spanish at home, but also used English with their children. In contrast, Luis's mother reported low-proficiency and low comfort-levels with English, and only spoke in Spanish with her child. It is possible that Samuel's father and Camilo's mother felt more comfortable with (a) techniques taught in a mainstream parent-implemented intervention and/or (b) their relationship with a non-Hispanic clinician who spoke Spanish as a second language, because they had higher levels of acculturation with English-speaking culture than Luis's mother. Research has demonstrated that parents participate in parent training programs over longer periods of time if they share the same ethnicity as the trainer (Dumas, Moreland, Gitter, Pearl, & Nordstrom, 2008). These factors may have influenced Luis's mother's decision to cancel sessions or to end the ART program before completing all sessions.

Second, the families in the current study all had varying education levels and financial needs, which could have impacted their caregiving styles and ability to maximize on the ART program. Dumas and colleagues (2008) found that parents' socioeconomic status (SES) influenced their engagement during parent trainings, more so than sharing ethnicity with the trainer. Fewer financial and educational resources also means that families have fewer resources to devote to their children (Conger & Donnellan, 2007). It is possible that Luis's family had fewer financial and educational resources at their disposal, resulting in more stress and less assets to devote to Luis's treatment.

Third, ART's relevancy to the families' lives could have impacted their acceptance of the program. Regarding both SES and ethnicity, research shows that differences between the trainer and family may be less important than the family feeling like they are respected and that the program addresses their needs (Dumas et al., 2008). Samuel and Camilo's progress during ART may have made the program seem valuable, motivating the parents to use the ART strategies more regularly. On the other hand, if Luis's mother felt like her son was not making progress, she may have viewed ART as less relevant to her family's needs and so participated less frequently. The resulting parent fidelity to intervention could have continued to impact child outcomes, with child outcomes and parent fidelity influencing one another back-and-forth over time. This pattern of child and parent outcomes is supported by the Transactional Model of Development, which posits that child and parent behaviors affect one another in a bidirectional manner (Fiese & Sameroff, 1989; Sameroff, 2009).

Finally, there may have been factors influencing the participation of Luis's family that were not measured or reported. For a deeper exploration of this topic, readers are referred to the second paper involving these participants (Kinard & Watson, in preparation-a), which discusses the families' experiences and perceptions about the ART intervention based on qualitative interviews.

Conclusion

This study provides promising evidence in support of ART's impact on social-communication for Hispanic children with ASD. After participating in the ART intervention, two out of three children with ASD made improvements in social-interaction and requesting skills. Joint attention also increased for one child during ART, but these improvements did not provide clear treatment effects. All of the parents rated their children's social-communication as improved after ART, providing some evidence for the intervention's social validity. Overall, the ART intervention appears to be a promising option for primarily Spanish-speaking families, particularly for families who share similar characteristics as the participants in this study. These findings are particularly timely, in light of the growing prevalence in the US of Hispanic children with ASD and the documented disparities encountered by these families compared to mainstream families in accessing appropriate services for their children.

CHAPTER 4: “I WANT TO LEARN MORE”: HISPANIC PARENTS’ EXPERIENCES WITH EARLY ASD INTERVENTIONS

Introduction

Family-centered care is a potentially powerful way to improve the outcomes of children with autism spectrum disorder (ASD) and their families. When practitioners implement family-centered principles, they empower families to participate and make decisions about their child’s care, increase families’ sense of self-efficacy and well-being, and enhance the development of children with disabilities (Dunst, 2009; Trivette, Dunst, & Hamby, 2010). Despite these benefits, early intervention providers implement some components of family-centered care, but fail to use and/or value other principles (Crais, Roy, & Free, 2006). Complicating matters, clinicians and families from diverse cultural backgrounds may have different views about what practices are “common sense” (Harry, 2008, p. 375), potentially making family-centered care more difficult to implement in diverse populations.

Supporting this idea, researchers have discovered many disparities in family-centered care according to cultural background. Families of children with ASD experience more disparities in family-centered care than families of children with other special needs (Montes & Halterman, 2011)—and among families of children with ASD, Hispanic populations in the United States face more healthcare disparities when compared to white, non-Hispanic families (Magaña et al., 2012). Specifically, Hispanic children with ASD are significantly less likely to: receive family-centered care from their doctors (Magaña et al., 2012; Parish et al., 2012); have access to intervention services (Harstad et al., 2013; Parish et al., 2012; Thomas et al., 2007); and make as many developmental gains as white, non-Hispanic children with ASD (Fountain, Winter, & Bearman, 2012). Hispanic families have reported receiving poor family-centered ASD healthcare during pediatrician visits and ultimately losing trust in their healthcare providers. (Magaña et al., 2012; Parish et al., 2012; Zuckerman et al., 2014). Pediatricians have also reported communication and cultural barriers when serving Hispanic families of children at-risk for ASD (Crais et al., 2014; Zuckerman et al., 2013). These findings highlight the serious need to improve family-centered care for families of children with ASD, particularly those from diverse cultural backgrounds.

An important step toward improving family-centered care for these families would be to bridge the cultural divide between professionals and families, helping professionals understand the viewpoints of families from diverse

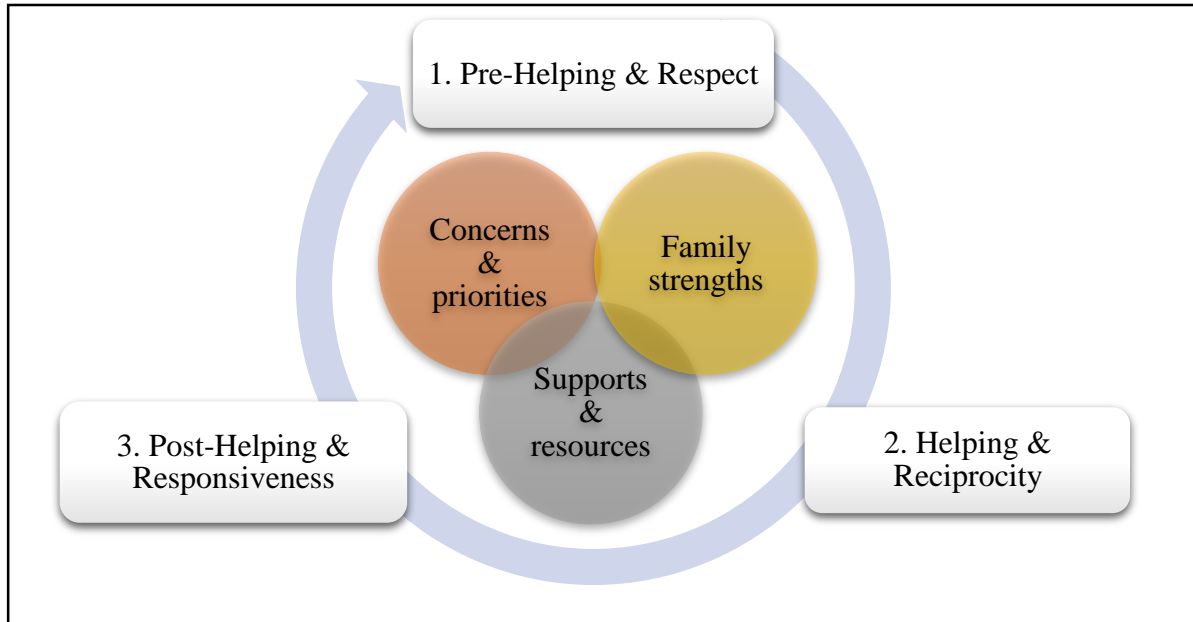
cultures. To address this issue, researchers are beginning to focus on Hispanic families of children with ASD, gathering important findings about family-centered care during assessments and other health visits with pediatricians (Magaña et al., 2012; Parish et al., 2012; Zuckerman et al., 2014). Unfortunately, no research exists on early intervention services for this population. For children with special needs, in general, researchers have speculated that “mainstream” early intervention programs may clash with the beliefs of culturally diverse families, including Hispanic families (Langdon, 2009; van Kleeck, 1994; Wing et al., 2007). However, ASD creates unique needs for families, as evidenced by the disparities among children with ASD across cultures (Montes & Halterman, 2011), and warrants examination of what Hispanic families of children with ASD, specifically, are experiencing during early intervention programs.

In the current investigation, we explored this issue by interviewing parents from three Hispanic families of children with ASD about their experiences with early intervention programs. This study is based on two models of family-centered care. The first model is called Family-Systems Intervention, which includes four components: capacity-building help-giving practices, family concerns and priorities, family strengths, and supports and resources. Use of this model is directly related to feelings of parent self-efficacy and well-being, which, in turn, are directly related to the quality of parent-child interactions and child development (Trivette et al., 2010). The first component of the Family-Systems Intervention model involves capacity-building help-giving practices, wherein “help-seekers” (e.g., families of children with disabilities) benefit the most from services when “help-givers” (e.g., practitioners) go through three stages: (1) the “pre-helping stage,” where practitioners believe that families are capable decision-makers; (2) the “helping” stage, where practitioners actively encourage families to become skilled problem-solvers and decision-makers for their child; and (3) the “post-helping” stage, where practitioners are positive and supportive once families have made decisions (Dunst, Trivette, Davis, & Cornwell, 1988). Through the lens of help-giving practices, professionals can address three areas: (1) family concerns and priorities; (2) family strengths; and (3) supports and resources (Trivette et al., 2010).

The second family-centered care model used in this study is called Skilled Dialogue (Barrera & Corso, 2002). With Skilled Dialogue, practitioners use three qualities of interaction to resolve conflicting viewpoints with families: (1) respect (i.e., recognizing and respecting diverse viewpoints); (2) reciprocity (i.e., engaging in back-and-forth discussions, where each party feels valued and contributes to decision-making), and (3) responsiveness (i.e., responding to others’ viewpoints in a positive way and collaboratively making decisions that incorporate multiple

viewpoints). Figure 8 illustrates how to combine the Family-Systems Intervention model and Skilled Dialogue to create family-centered and culturally-relevant care.

Figure 8. Conceptual Model for Family-Systems Intervention and Skilled Dialogue



Note. Adapted by J. Kinard from Barrera and Corso (2002), Dunst et al (1988), and Trivette et al. (2010)

As explained in these models, it is important to recognize that families have diverse beliefs about: (a) their concerns and priorities, such as which ASD symptoms are most concerning to them, what they believe is causing these symptoms, and how they think these symptoms could change in the future (Hebert, 2014; Kleinman, 1978; Mandell & Novak, 2005); (b) their strengths and characteristics as a family (Hebert, 2014); and (c) which supports and resources would best address their concerns and priorities, as well as make use of their strengths as a family (Hebert, 2014; Kleinman, 1978; Mandell & Novak, 2005). These beliefs could shape families’ healthcare practices and, ultimately, influence child outcomes (Barrera & Corso, 2002; Kleinman, 1978; Mandell & Novak, 2005). In addition, how clinicians incorporate and respond to family beliefs could change how parents feel about intervention services and their decisions to participate (Harlin & Rodriguez, 2009). Below, we provide examples of how parents’ beliefs could influence families’ preferences for early intervention.

In the area of concerns and priorities, parents may form treatment preferences based on the symptoms or behaviors that are most concerning to them (Hebert, 2014; Mandell & Novak, 2005). For example, Hispanic parents may encourage their children to focus on “family” treatment goals rather than focusing on “individual” goals

(Langdon, 2009; Rodriguez & Olswang, 2003; Wing et al., 2007). Another priority in Hispanic families may be the development of the child's native language (Kummerer, 2012; Puig, 2012). Families could have different interpretations of what caused their child's symptoms, which may influence their treatment preferences (Hebert, 2014; Ravindran & Myers, 2012; Wilder et al., 2004). If families believe the disorder was caused by biological factors, they may seek traditional treatments, whereas beliefs about environmental causes could lead to use of complementary and alternative medicine (CAM), such as special diets (Ravindran & Myers, 2012). Finally, families could have varying beliefs about the course of their child's symptoms, ranging from thinking that their child can be cured (Hebert, 2014; Kummerer, 2012; Mandell & Novak, 2005), to a belief that treatments can do nothing to help, or to believing that their child will always have difficulties but can improve with treatment (Mandell & Novak, 2005). Some Hispanic parents may believe in *fatalismo*, the idea that they have little power to change their child's fate (Mandell & Novak, 2005; Olivares & Altarriba, 2009), and so might do little to encourage the child's development. In addition to concerns about their child, parents may have concerns about themselves as caregivers. For example, Hispanic mothers of children with disabilities have high rates of depression, possibly due to acculturative stress, minimal social supports, and/or stigmas about the mother causing the child's disability (Nehring, 2007; Olivares & Altarriba, 2009).

In terms of family strengths, parents may make treatment decisions based on how particular treatment approaches make use of their strengths, such as parenting styles (Hebert, 2014). Authoritative parenting may align well with more structured, adult-directed behavioral intervention approaches to ASD, whereas non-authoritative styles may fit better with relationship-based ASD approaches (Hebert, 2014). As an example, many relationship-based interventions teach parents to be highly responsive to the child's focus of attention, so that through this parental support, children will make gains in social-communication skills (e.g., Carter et al., 2011; Karaaslan et al., 2013; Siller et al., 2013). However, certain parent-responsiveness strategies may seem unnatural for traditional Hispanic parents, such as: (a) engaging in equal, one-to-one play and conversations with their child; (b) being non-directive and following the child's lead; (c) describing their actions for the child; and (d) giving the child choices (Binger, Kent-Walsh, Berens, Del Campo, & Rivera, 2008; Kummerer, 2012; Kummerer et al., 2007; Langdon, 2009; van Kleeck, 1994; Westby, 2009; Wing et al., 2007). Along with parents, different family members may want to participate in the treatment program (Nehring, 2007). Hispanic children may have multiple caregivers, including their siblings (Orellana, 2003; Parra Cardona et al., 2009), as well as extended family members. Further, families

may wish to use caregiver routines in the development of intervention goals and activities for the child (Wilcox & Woods, 2011).

In summary, parents have many beliefs about what their child needs, what they need as parents, and how they want to use their strengths, as a family, to address those concerns. These beliefs can shape what types of interventions parents want to receive and how they want to participate in those interventions. It is crucial for clinicians to use family-centered principles during intervention, so that both they and the family feel their beliefs are being respected and addressed. Unfortunately, family-centered principles are not always used, particularly with children with ASD and even more so among Hispanic children with ASD. Knowing more about early intervention experiences of this population will help bridge these gaps, providing guidance on what concerns parents have for their children and family, how they view their role in early intervention, and what types of early interventions they prefer.

To address this need, the current investigation explored the acceptability and feasibility of an early intervention in Spanish-speaking families of children with ASD. All participating families had recently completed the Adapted Responsive Teaching (ART) intervention during a single-case design study (Kinard & Watson, in preparation-b). ART is a parent-mediated program designed to increase parent responsiveness and child social-communication (G. T. Baranek et al., 2015). The parents' perceptions of the ART intervention were the primary focus of the current study.

Methods

Participants and Settings

This study was approved by the Institutional Review Board at the University of North Carolina at Chapel Hill. The sample included 5 caregivers from three families (one mother and two mother-father pairs) who participated in a single-case design (SCD) study of the ART intervention (Kinard & Watson, in preparation-b). The participants met the following inclusion criteria: (1) families self-identified as Hispanic and primarily Spanish-speaking (i.e., spoke Spanish >50% of the time at home); (2) families were enrolled in a single-case design study of the ART intervention; (3) their children met criteria for an autism spectrum disorder (ASD), as measured by the Autism Diagnostic Observation Schedule (ADOS; Lord et al., 2012); (4) their children demonstrated expressive language delays, as measured by the Preschool Language Scale-5—Spanish Edition (i.e., expressive communication standard scores are at least 1.5 standard deviations below the mean) (PLS-5S; Zimmerman et al., 2012); (5) their

children were between 2 – 4 years of age; and (6) their children had problems with social play, as reported by their caregivers and confirmed by the project assessors. Families were excluded from the study if the children demonstrated co-morbid conditions, such as Down syndrome, fragile X syndrome, or hearing loss. All caregivers chose to complete the interviews at home.

Procedures

Recruitment. Three families who were enrolled in a single-case design (SCD) study of ART (Kinard & Watson, in preparation-b) were invited to participate in semi-structured interviews at two time points: before and after completing the ART intervention. Four parents participated in interviews before the ART intervention (two mothers and one mother-father pair). Three of these same parents participated in the post-ART interviews, along with an additional parent who did not complete the initial interview (one father, one mother, and one mother-father pair). Demographic information is presented in Table 11. It should be noted that 2 boys and 1 girl participated in the SCD study. However, since two of the families were acquaintances and helped recruit one another to the study, all of the children will be referred to as boys in this paper, including siblings, to reduce the possibility of deductive disclosure.

An abbreviated description of the SCD procedures is included here to provide context for the respondents' interview answers. For a full description of the SCD procedures, see Kinard and Watson (in preparation).

Assessment prior to SCD. After providing informed consent, families participated in an initial assessment. Data were collected on the children's ASD status, expressive and receptive language, and social-communication skills, as well as on parent responsiveness. Family demographic information was collected, including information about the family's level of acculturation. Assessment results are presented in Table 12.

SCD baseline phase. Families participated in a baseline phase prior to beginning the ART intervention, with the length of baselines staggered across families. Data were collected during one-to-one, 10-minute free-play sessions at home. Parents were told their child as they typically would at home, using whatever materials they would like.

SCD intervention phase. An abbreviated version of ART intervention (G. T. Baranek et al., 2015) was implemented with each family. ART is a manualized parent-mediated intervention, based on the Responsive Teaching (RT) curriculum (Mahoney & MacDonald, 2007) in which parents are taught responsive teaching strategies in order to improve children's functioning in a variety of domains. ART targets two broad areas:

Table 11

Participant Demographic Characteristics

	Child 1	Child 2	Child 3
Family			
Languages spoken at home	Spanish & English	Spanish	Spanish & English
Frequency of Spanish with child	>50% of the time, but not always	100% of the time	>50% of the time, but not always
Household income	Missing	Missing	\$35,001 to \$40,000
Public assistance programs	None	Free or reduced lunch at school	Women, Infants, and Children (WIC)
Mother			
Age at entry (years)	31, 32, and 40 years old*		
Ethnicity	Hispanic or Latino	Hispanic or Latino	Hispanic or Latino
Country of origin	Colombia, Honduras, and Mexico*		
Years in USA	5.5 years, 12 years, and 14 years*		
Education	Bachelor's degree	Less than 8 th grade & General Educational Development (GED) test	9 th – 11 th grade
Employment	Not currently working	Not currently working	Not currently working
Father			
Age at entry (years)	32, 38, and 42 years old*		
Ethnicity	Hispanic or Latino	Hispanic or Latino	Hispanic or Latino
Country of origin	Mexico, Honduras, and USA/Mexico*		
Years in USA	5.5 years, 12 years, >18 years*		
Education	Master's degree	Less than 8 th grade	Associate's or 2-year degree
Employment	Full-time employment	Full-time employment	Full-time employment & part-time student
Child			
Age at ART assessment	4 years; 4 months	3 years; 2 months	2 years; 9 months
Age at start of ART	4 years; 5 months	3 years; 4 months	3 years; 1 month
Age at end of ART	4 years; 9 months	3 years; 7 months	3 years; 3 months
Average ART sessions/week	1.47	1	1.89
Time between end of ART & interview	16 days	28 days	10 days
Gender	2 boys and 1 girl* (all children are referred to as "boys" in this paper to reduce the possibility of deductive disclosure)		
Ethnicity	Hispanic or Latino	Hispanic or Latino	Hispanic or Latino
Country of origin	USA	USA	USA
Years in USA	Whole life	Whole life	Whole life
Time since ASD diagnosis at assessment	2 years	1.5 years	6 months

Note. *Summarized across participants to reduce the possibility of deductive disclosure.

Table 12

Initial Assessment Results

	Child 1	Child 2	Child 3
PLS-5 Spanish			
Expressive communication (EC)			
Raw score	24	24	16
Standard score	60	73	54
Percentile rank	1	4	1
Standard deviation (SD)	2 SDs below average	1.5 SDs below average	3 SDs below average
Auditory comprehension (AC)			
Raw score	17	27	18
Standard score	50	61	50
Percentile rank	1	1	1
Standard deviation (SD)	3 SDs below average	2.5 SDs below average	3 SDs below average
Total language score			
Raw score	110	134	104
Standard score	51	65	50
Percentile rank	1	1	1
Standard deviation (SD)	3 SDs below average	2 SDs below average	3 SDs below average
Significant difference between EC & AC?	Yes	Yes	No
ADOS			
Module	1: Some Words	1: Some Words	1: No Words
Social affect (SA)	13	4	16
Restricted and repetitive behavior (RRB)	6	4	6
Total SA & RRB	19	8	22
Cut-off	Autism	Autism spectrum disorder	Autism
Parent BAS			
Parent	Father	Mother	Mother
Hispanic domain score	3.75	3.9	3.5
Non-Hispanic domain score	2.25	1.1	2.4
Level of acculturation (above 2.5)	Hispanic	Hispanic	Hispanic

Note. PLS-5 Spanish = Preschool Language Scale-5 Spanish version; ADOS = Autism Diagnostic Observation Schedule; BAS = Bidimensional Acculturation Scale

social-communication and sensory-regulatory goals. Within these goals, several pivotal behaviors can be targeted. For the purposes of the SCD study, only the social-communication domain was targeted. Another modification was that the ART intervention was provided in Spanish, based on Spanish-translations provided by a collaborator on the RT intervention (F. Perales, personal communication, July 23, 2013) and additional ART materials translated into Spanish by research assistants who were native Spanish speakers. The interventionist was a speech-language pathologist who spoke Spanish as a second language (primary author).

Before introducing any information about ART, the interventionist interviewed the family about their routines and concerns about their child, using the Family Routines Exploration and Description – Revised (FRED-

R) interview (Wakeford et al., 2009). This interview covers the following topics: (a) the family's routines in the morning, afternoon, and evening, as well as "adult" routines (e.g., cleaning, relaxing, having guests over) and other routines not already discussed; (b) how the child participates in those routines; (c) any parental concerns about the child's participation; and (d) strategies that the parents have used to address those concerns. The interventionist took notes in Spanish during the interview and provided a copy of the notes to the family. The following parents participated in the pre-ART interviews: (a) Family 1: the mother and father together; (b) Family 2: the mother; and (c) Family 3: the mother. Two of the families' interviews were audio-recorded; one of the interviews was not audio-recorded due to technical issues. The interviews ranged from about 20 – 45 minutes in length.

The interventionist then scheduled ART intervention sessions in the family's home twice weekly for 60 – 70 minutes per session. In the initial parent education sessions, the interventionist provided an overview of the ART social-communication content, and engaged the family in a discussion about how their concerns on the FRED-R related to the social-communication targets offered in ART. Based on this discussion, families chose which social-communication behaviors they would prefer to address during ART. Four behaviors were offered to families from the domain of social-communication: (1) social play, or communicating to participate in social games and routines; (2) requesting, or communicating to ask for objects; (3) joint attention, or communicating simply to share interest in an object, rather than to ask for the object; and (4) symbolic play, or playing with objects in a pretend play manner. Families chose the following targets, based on their concerns and priorities: (1) Family: social play, requesting, and joint attention; (2) Family 2: social play and requesting; and (3) Family 3: requesting and social play. No family chose to target symbolic play. After the family's social-communication targets were decided, the interventionist oriented the family to the intervention notebook (which included parent education materials about the program), discussed how ART strategies could be used to target the child's social-communication behaviors, and answered questions.

After the parent education sessions, each intervention session proceeded as follows. First, a 10-minute parent-child free play video was recorded for the purpose of tracking child progress. Next, the interventionist introduced one or two responsive teaching strategies that could be used to address the child's social-communication target. Responsive teaching strategies are categorized into five dimensions of responsiveness: (1) match (i.e., matching adult behaviors to the child's developmental level, interests, and behavioral style); (2) reciprocity (i.e., engaging in back-and-forth, joint activities with the child); (3) control (i.e., sharing control of the interaction and

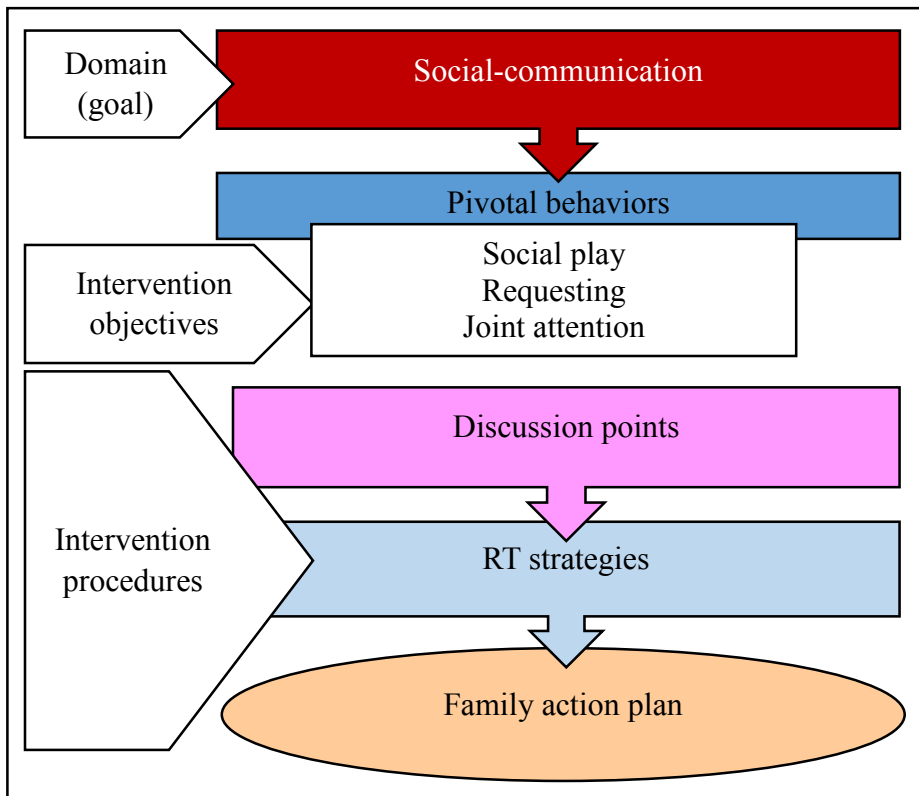
scaffolding the child's play); (4) contingency (i.e., responding to the child's behavior promptly, frequently, and in a meaningful way); and (5) affect (i.e., demonstrating animation, enjoyment, warmth, and acceptance of the child).

In addition to the responsive teaching strategies, the interventionist provided a "discussion point" for each session, which explained the rationale for that day's content. After discussing the material with the parent, the interventionist modeled how to use the strategy with the child. The caregiver then practiced using the strategy, while the interventionist provided instruction and support. Parents were also encouraged to ask questions and provide feedback. At the end of each session, the interventionist and caregiver brainstormed how the family would practice at home before the next session, creating a "family action plan." The family action plans included which family member would practice the strategy during which specific activities and/or times of day (e.g., father will practice during breakfast; mother will practice during bath time; etc.). The interventionist took session notes in Spanish and provided a copy of the notes to the caregiver. The caregiver was encouraged to use the strategy between sessions, as discussed in the family action plan. Thus, each session and handout included a pivotal behavior, one-to-two responsive teaching strategies, a discussion point, and a family action plan. In the following session, the parent-child video was recorded, and then the interventionist and caregiver discussed how well that strategy worked during the week. The interventionist then introduced a new strategy for that day's lesson, and the session proceeded as described above.

Each family participated in ART sessions as follows: (a) Family 1: initial parent education for 1 session; social play for 7 sessions; requesting for 8 sessions; and joint attention for 8 sessions; (b) Family 2: initial parent education for 1 session; social play for 8 sessions; and requesting for 5 sessions; and (c) Family 3: initial parent education for 2 sessions; requesting for 8 sessions; and social play for 8 sessions. After completing the intervention, the interventionist wrote intervention summaries for each family in Spanish, which were reviewed for accuracy by a research assistant who was a native Spanish speaker. These summaries were discussed in person with each family after their final ART session. The conceptual model for ART is illustrated in Figure 9.

Qualitative study. After finishing the ART intervention, the caregivers completed a semi-structured interview about their experience with ART for the purposes of the current study. The interview was conducted by a native Spanish-speaking research assistant. An interviewer other than the interventionist was chosen in order to help caregivers feel comfortable sharing their opinions; however, the families were aware that the interventionist would see transcripts of the interviews at a later point in time. The post-ART interview explored the family's perceptions of

Figure 9. ART Conceptual Model © 2009 (Wakeford et al.), Modified for Single-Case Design



the ART intervention in terms of how feasible it was to use in their daily lives and the extent to which they found the program valuable. Specifically, the interview addressed the following topics: ART goals and family’s concerns for child; ART strategies and family’s use of those strategies; the structure of the ART sessions; the family’s role in therapy; other therapies the family has received; and recommendations for using ART in Hispanic cultures. The full interview guide can be viewed in Appendix A.

The goal was to schedule interviews within 2 weeks after finishing the ART intervention. The families’ actual participation was as follows: (a) Family 1 (the father): 16 days after the last ART session; (b) Family 2 (the mother): 28 days after the last ART session; and (c) Family 3 (the mother and father together): 10 days after the last ART session. Family 3’s interview occurred at a later date due to scheduling conflicts. Specifically, Family 3 was scheduled to receive 3 additional ART sessions; however, the mother rescheduled these sessions several times before eventually requesting to end participation in the intervention. The interviewer audio-recorded the interviews and took hand-written notes about the families’ responses. The interviews ranged from about 30 – 60 minutes in length.

A professional service transcribed the audio-recordings of the families' initial interviews (i.e., prior to ART with the FRED-R protocol) and final interviews (i.e., after ART). The service then translated the Spanish transcriptions into English. To ensure accuracy, the primary author compared (a) the Spanish transcriptions with the audio-recording and (b) the English translations with the Spanish transcriptions. The interviewer was consulted when translations or transcriptions were unclear.

Data Analysis

Qualitative methods were used to analyze the interviews. A hybrid approach of using both deductive and inductive data analysis has been identified as a rigorous method of analyzing qualitative data (Fereday & Muir-Cochrane, 2008). Using this hybrid approach, we first implemented theoretical thematic analysis, or a deductive analytical approach, to explore the interview data in a "top down" fashion for patterns that fit within a conceptual framework, allowing for a detailed view of a particular concept or theory (Braun & Clarke, 2006, p. 83; Fereday & Muir-Cochrane, 2008). In this case, the codes were organized according to principles from the Family-Systems Intervention model (Dunst et al., 1988; Trivette et al., 2010) and Skilled Dialogue (Barrera & Corso, 2002). Figure 8 illustrates a conceptual model of these principles.

The reason for using this framework was because principles of family-centered care were implemented throughout ART in order to empower families and help them become invested in the ART intervention; thus, we were interested to see how parents' comments fit within models of family-centered care. The main components explored in this framework included: (a) three stages of help-giving: pre-helping and respect; helping and reciprocity; and post-helping and responsiveness; and (b) three areas to address in each help-giving stage: family concerns and priorities; family strengths; and family views of supports and resources. Within this theoretical framework, we then used an inductive or "bottom up" analytical approach to identify subthemes within the data. Thus, the questions we asked parents were organized around principles of family-centered care, and it was expected that deductive data analysis would organize answers into this framework. However, we did not know what subthemes would emerge within these categories, and so inductive data analysis was important for discovering the specific experiences of these families.

Analysis primarily occurred using the English translations of the pre-ART and post-ART interviews; however, the Spanish transcripts were also reviewed to confirm patterns found in the English translations, as well as identify additional themes relevant to the Spanish language. Atlas.ti software was used to complete the qualitative

analysis. Codes were created to identify particular themes, along with a codebook that provided: (a) operational definitions, (b) examples, and (c) non-examples of each code. This analysis occurred in an iterative process, where themes and concepts were elaborated and refined as more information was gathered. Once codes were identified, they were organized according to various patterns, allowing for analysis of similarities and differences, as well as relative importance of the information (Rubin & Rubin, 2011). The pre-ART and post-ART interviews were compared to one another, along with the interventionist's treatment notes. Comparing, or "triangulating," these three sources of data added richness to the findings and also helped verify the trustworthiness of the themes (Sage & Jegatheesan, 2010; Yu, 2013). Specific details about how the analysis occurred are described below.

First, the primary author (who was also the ART interventionist) created a codebook a priori based on the structural framework of the Family-Systems Intervention model (Dunst et al., 1988; Trivette et al., 2010) and Skilled Dialogue (Barrera & Corso, 2002), as well as an initial review of the interview transcripts. She and a research assistant who had attended some of the intervention sessions met to discuss and revise the codebook. Next, the primary author and the research assistant separately reviewed the transcripts for these codes, creating additional codes to represent subthemes in the data. After completing the initial analysis, they met to discuss their findings and revise the codes. For example, repetitive codes were eliminated or merged with other codes, new codes were created as necessary, and codes were reorganized into patterns that best captured the themes. The primary author completed this process a second time, recoding all of the transcripts according to the revised codebook. The primary and secondary author then met to discuss and confirm the themes that emerged from the data. A summary of these themes were given to the post-ART interviewer, so that she could review the findings based on her experiences conducting the interviews, as well as her perspective as a native Spanish-speaker from Hispanic culture. The interviewer confirmed the findings and provided additional insight on the themes based on her perceptions of the interviews. The primary author reviewed these findings with the research team and, based on the team's feedback, recoded the transcripts a final time.

Results

Over the course of the qualitative analysis, the structural framework was adjusted to better reflect the themes. The adjusted framework included the following components from the Family-Systems Intervention model (Dunst et al., 1988; Trivette et al., 2010) and Skilled Dialogue (Barrera & Corso, 2002): (a) pre-helping and respect stage: parents' concerns and priorities for their child, as well as their family strengths and characteristics; (b) helping

and reciprocity stage/non-ART: parents' experiences with supports and resources, not including the ART intervention, in terms of how these resources addressed their concerns and priorities and family strengths; (c) helping and reciprocity stage/ART: parents' experiences with the ART intervention, in terms of how ART addressed their concerns and priorities and family strengths; and (d) post-helping and responsiveness stage: parents' perception of the ART program based on their experiences during the helping and reciprocity stage.

The themes derived from the qualitative analysis are presented below, organized according to this framework. Quotations from the families' final interviews are included to provide examples of each theme. A summary of the themes is presented in Table 13.

Table 13

Summary of Themes from Qualitative Analysis

	Pre-Helping and Respect	Supports and Resources		
		Helping and Reciprocity: non-ART	Helping and Reciprocity: ART	Post-Helping and Responsiveness: ART
Concerns and Priorities	Communication and language	School-related services; strategies the parent has adopted or prefers	ART matched parents' hopes for child, but parents still have concerns	
	Social relationships	Strategies the parent has adopted or prefers	ART matched parents' hopes for child, but parents still have concerns	
	Sensory issues	None mentioned	None mentioned	
	Restricted interests and repetitive behaviors	Strategies the parent has adopted or prefers	ART matched parents' hopes for child, but parents still have concerns	
	Brain development	Strategies the parent has adopted or prefers	ART provided consistency	
	Attention and concentration	Strategies the parent has adopted or prefers	ART matched parents' hopes for child, but parents still have concerns	
	Emotions and behavior	School-related services; strategies the parent has adopted or prefers	ART matched parents' hopes for child, but parents still have concerns	
	Pretend play	None mentioned	ART matched parents' hopes for child, but parents still have concerns	
	Academics	Other treatment programs and supports; strategies the parent has adopted or prefers	ART matched parents' hopes for child, but parents still have concerns	

	Self-care	Other treatment programs and supports; strategies the parent has adopted or prefers	ART matched parents' hopes for child, but parents still have concerns	
	Need help as parents	Other treatment programs and supports; school-related services	ART provided education and support for parents	Feeling grateful and happy about participating in ART
Family Strengths and Characteristics	We're all human	School-related services	Family is immersed in ART, but some ART strategies did not feel natural	Positive view of clinician-parent interaction
	Parents' language and child's language environment	School-related services	ART encouraged teamwork	Positive view of clinician-parent interaction
	Parents' style of communicating and playing with child	Other treatment programs and supports	Family is immersed in ART, but some ART strategies did not feel natural	
	Parent knows child's likes and dislikes	Preferences for their child's services	ART encouraged teamwork	
	Mother and father's responsibilities, routines, and motivation within Hispanic cultures	School-related services; preferences for their child's services	The only option we have as parents is to participate; ART encouraged teamwork; family is immersed in ART, but some ART strategies did not feel natural; other parental responsibilities created obstacles	Positive view of clinician-parent interaction; recommendations for promoting ART
	Sibling's responsibilities and time with parent	School-related services	Family is immersed in ART, but some ART strategies did not feel natural	
	Family's home, materials, and finances	School-related services; other treatment programs and supports; preferences for child's services	Use of parents' home, materials, and finances	

Pre-Helping and Respect Stage

Themes under the “pre-helping and respect stage” provide a picture of the families’: (a) concerns and priorities; and (b) their strengths and characteristics as a family, separate from participation in any intervention program.

Concerns and priorities. In both the pre- and post-ART interviews, caregivers expressed concerns and identified priorities for their child, family, and themselves. These concerns and priorities included the following: communication and language; social relationships; sensory issues; restricted interests and repetitive behaviors; brain development; attention and concentration; emotions and behavior; pretend play; academics; self-care; and needing help as parents. These subthemes are detailed below.

Communication and language. All three families expressed a desire for their child to have normal development in general, and specifically related to communication. Families reported concerns about their child's ability to be verbal, request, communicate for social reasons, and to share information with the parent. One parent expressed this idea as follows: "The hopes I have for Luis is that he completely achieves talking, communicating, socializing with the other children, adults." Another family emphasized the importance of social-communication within Hispanic cultures:

Father: "As Latinos, we're very open. And we're very social. Very, very friendly. So, of course, socializing is something very, very important, and communication..."

Mother: "We talk a lot. [Laughter]"

Father: "We talk, exchange feelings, words, conversations with each other, so reinforcing that."

Families also discussed the importance of their child learning to use Spanish or English, and all shared different perspectives on this issue. One caregiver felt it was important for his child to learn both English and Spanish and expressed concerns that Spanish might confuse the child, since he was learning English at school; another caregiver explained that it was important for her child to learn Spanish, "because that's our language"; and a third caregiver explained that "I don't really care if it's Spanish or English. All I want is that the child communicates and socializes and has normal development at his age."

Social relationships. The child's relationships with other people were also identified as a primary concern for all three families. Caregivers differentiated the child's relationships with people "outside the circle" (i.e., unfamiliar people) and "inside the circle" (i.e., family members). Parents expressed desires for their child to interact well with unfamiliar people, and indicated that difficulties with unfamiliar people restricted the family's ability to participate in activities outside the home. One mother explained:

"I don't bring people here. And we hardly go to anyone's house either.... If he wants a toy, for example, that another kid has, and the kid doesn't want to let him have it, then that's a whole ordeal. So my husband and I decided that we weren't going to go to other people's houses, but rather stay here, at home. And it's the same thing with public places."

All three families reported difficulties with familiar relationships, as well, and desired for the child to show affection and participate with the family. When asked what his relationship was like with his son before participation in ART, one father explained: “Mm, well I’d say that, I don’t want to say it – I mean, it’s hard to accept it sometimes, but, distant, because if I saw that – that he didn’t want to be there, right? Uh, uh, I thought that maybe that’s – that’s the way he is, right?”

Sensory issues. Sensory sensitivities were identified as a concern in all families, particularly sensitivities to loud noises and being touched. These sensory concerns overlapped with the parents’ concerns about the child’s social and communication skills. Two families reported that noise sensitivities restricted how well the child participated inside and outside the home, such as at church, parks, and other people’s houses. One mother described her interactions with her son as follows: “There are days when he doesn’t want me to touch him.” Another parent explained: “After I change his diaper, I put his clothes on. Sometimes he lets me, sometimes he doesn’t, due to the sensory thing.”

Restricted interests and repetitive behaviors. The children were all described as being obsessively interested in particular items or rituals, with one child also showing motor stereotypies, such as hand flapping. Some caregivers identified restricted interests and repetitive behaviors as a concern, particularly when these disrupted the child’s ability to participate in family activities and routines. One mother described her child’s ritual of turning pages in a book: “He just—he turns the pages. But when I start to read, he gets angry and throws the book.” However, caregivers also talked about how the child’s interest could be used to motivate the child to participate in play and family routines. One parent used her child’s interest in the mall as a reward: “Sometimes he doesn’t want to put on his pajamas, but I tell him that he has to go to sleep, because tomorrow is a new day of going to the mall. And then he calms down a bit, because he really loves the mall.”

Brain development. One of the three families expressed strong concerns about their child’s brain development, explaining the belief that their child’s brain is not functioning correctly, creating their child’s other difficulties, and that there is a critical period of development for their child to learn certain skills. For example, the mother stated: “It’s his brain. The problem is there, all the way inside.”

Attention and concentration. Two families explained that their child had difficulty paying attention and concentrating, which negatively impacted the child’s ability to participate in social and learning activities. One parent described his child as “hyperactive” and another parent explained that “he won’t learn, he won’t concentrate,

he's going to be there all, 'boing-boing-boing.' Jumping... It's hard for him to concentrate and he gets up and leaves... that worries us a bit with him."

Emotions and behavior. All of the caregivers shared concerns about their child's emotions and behavior. Specifically, parents wanted their child to: (a) improve his behavior when feeling upset (e.g., to not throw tantrums; to not hurt self or others); and (c) to feel happy, rather than sad, anxious, or afraid. One parent explained how she would like her son "to wait, to not throw tantrums, to not throw things, to stop hitting people sometimes. Because when he's mad, he throws a lot of things." Another parent described the difficulties her husband faced, when trying to care for their child alone:

"He calls me and tells me, 'Honey, he's hitting himself. He wants to hit himself and I grab him and'—when he [my husband] grabs him, he [my child] starts to make his body like paralyzed. And so he [my husband] doesn't—'Okay, I am going to put you in the room and close the door,' but then he hears him hitting himself, so he says, 'No, not here. I can't leave him there.' So he has to go into the room and... I think he [my husband] gets frustrated."

One parent explained that she wanted her child to "be a happy human being," but that her son's communication difficulties created negative emotions: "Sometimes I think, oh, he wants the same thing as yesterday or the day before, but when I offer it to him, no. That's not what he wants and he starts crying. And that is our concern, that we want him to speak so that he can communicate. So that he can communicate and not cry as much."

Pretend play. One parent identified pretend play as a priority for his son, explaining: "That's what the child with autism needs. To use the parts of the brain where you have to imagine. I mean, not to be with everything concrete and... the tires on this car turn. And it's just for turning it. Right? Why not use the car to fly and... to go into outer space?"

Academics. Two families talked about trying to engage their child in academic activities, but having difficulty. For example, one parent explained that she was not as concerned about her child's ability to play with toys, but rather with his participation in book reading: "The only thing that we are struggling with him during playtime is the issue with books. He is not interested in books whatsoever. And that is not good. That's not good, young man." Another family talked about how they watch educational TV programs with their child, such as those that teach the alphabet. The third family did not bring up academic activities as a priority during the interviews.

Self-care and transitions. All three families described self-care and transitions as a struggle for their child, particularly transitioning to and completing following activities: potty-training (one family); eating (all three families); sleeping (all three families); and other self-care activities, like getting dressed and ready for school (two

families). One father talked about his son's difficulties transition from diapers to using the bathroom: "The potty-training things, you know, it's very important for a human being to be able to, above all at his age, because...he doesn't have that skill." Another parent described her child's difficulty with mealtime: "The majority of the time when he doesn't want to eat, he starts to cry. So I have to take my son and put him in his room so that we can eat in peace, because if not—it's time to eat and not have to deal with the crying." All caregivers explained how their child's difficulty with sleeping affected the parents' sleep: "I don't go to sleep, because if he doesn't sleep, I don't sleep."

Need help as parents. A major theme identified by all caregivers was that they "need help as parents." Three areas of need were described: (a) accepting ASD and knowing how to "handle" having a child with ASD; (b) social support and understanding from others; and (c) relaxation time for self and siblings.

In the first area of need, all families expressed the belief that the more a parent is aware of what to do, "the more you can help" the child, but that they "don't know how to handle this." One family discussed how they had a hard time accepting their child's ASD. Two families felt that there were misconceptions about typical development in their home country, and that some Hispanic parents are not aware that they can help their child. One parent explained: "Because in my country that's how it is. If a child doesn't speak at age seven, they don't care. Because they know they will speak in the end. But here in the United States, they deal with it differently. They know that if a child doesn't speak, there's a mental problem." All families talked about how, at times, they disagreed with their spouses about how to manage their child, or that one parent had more difficulty interacting with their child than another parent. One mother talked about her spouse's path to acceptance:

"He didn't want to accept that there was a problem. And right now he is going to [autism trainings], so then I tell him, 'Go, participate, get informed. That whatever they talk about there, you will learn and then when you're home, you can put it into practice.' Because that's not easy. No, this isn't easy. So, and when you don't know how to handle it, it's very frustrating. You want to kill yourself. You want to, oh no, it's – it's very frustrating, so he is at that level where he's becoming educated."

In addition to education about ASD, all three families also expressed the need for social support and/or that they encountered negative reactions in their extended families and the community, based on their child's behavior. One mother explained: "...[T]here are family members that are a little mean, that still don't understand that this isn't rebelliousness, so it's a problem." None of the families noted that extended family members were involved with their child prior to participating in the study. One mother explained that her extended family did not live in the

United States, and so could not be involved: “We don’t have family here, so basically our closest friends are our family.”

Finally, all parents talked about how they needed relaxation time. Parents discussed how they had limited time with friends and for vacation, because it was difficult to bring their child. One mother explained: “As far as relaxation, we don’t know what that is.” Parents also emphasized the importance of spending time with their other children, but that having a child with ASD made that difficult. One mother described how her child with ASD did not like when she interacted with other family members: “When I play with [my other child], he [my child with ASD] doesn’t like it—he doesn’t want me to play with [my other child]. He starts screaming. Or when his dad is sometimes talking to me, if his dad sometimes hugs me, he doesn’t want that. He gets angry. Screams.”

Family Strengths and Characteristics. In addition to their concerns and priorities, the caregivers described their family strengths and characteristics. The following themes fit under this category: we’re all human; parents’ language and child’s language environment; parents’ style of communicating and playing with the child; parent knows child’s likes and dislikes; mother and father’s responsibilities, routines, and motivation within Hispanic cultures; sibling’s responsibilities and time with parent; and family’s home, materials, and finances. These subthemes are described below.

We’re all human. Two families explained their belief that “when all is said and done, we’re all human”—the belief that shared characteristics across humanity help diverse groups of people to relate to one another. Specifically, “Hispanics, Latinos” and “American” (non-Hispanic) caregivers relate to one another as parents, particularly when they have a child with ASD, because “emotionally, it’s the same” and they “are in the same situation.” Parents also talked about how being human helped them relate to their child with ASD. One mother explained: “Because as a mother, you know when he doesn’t want to play and I understand him, sometimes I don’t want to cook. *[Laughs]* It’s the same. It’s the same. We’re human.”

Parents’ language and child’s language environment. The children in all three families encountered different language environments, based on the languages that their parents spoke. Two of the families reported that they primarily spoke Spanish at home, but also used English. These families code-switched between Spanish and English occasionally during the interviews, both when talking to the interviewer and when talking to their children. The third family reported only speaking Spanish and never used English during the interviews. All of the children encountered English at school. As noted under “concerns and priorities,” one family expressed concerns that their

child would be confused hearing English at school and Spanish at home, and so chose to give commands in English: “As a parent of a child with autism, I think that, to not confuse him more, we’ve decided to try to talk to him more in English. For the commands. Because outside, he’s going to encounter commands in English. ‘Stop. Come on. Go.’ [English commands]”

Parents’ style of communicating and playing with the child. Parents described different ways that they communicate and play with their child, and also spontaneously demonstrated interaction styles during the interviews. Communication styles included: asking questions (two families) and being the “one who always talks” (one family). In terms of asking questions, one father reported that “I ask him everything, but a thousand questions.” Two families spontaneously demonstrated question-asking during the interview when talking to their child. For example: “What do you want? What’s wrong? What do you want, my baby? What’s wrong? What do you want? I know you want to say something. What do you want...?” One mother also explained that “...we’re talking about a boy who isn’t verbal, so I’m the one who always talks...it’s hard for me to keep quiet.”

In addition to communication, parents’ interaction styles included: playing with child for short amounts of time (one family); having patience (two families); and imitating child’s sounds (one family). In terms of how long play interactions lasted, one mother talked about how she could only play with her child for short amounts of time: “And then we sit and play...I don’t play with him for more than 30 minutes. Generally 15 to 20 minutes. I’m not there with him for too long because he gets tired. He gets irritated quickly.” Two families emphasized the importance of having patience when interacting with their child, but that patience can be hard. For example, one mother explained: “His dad tells me that we have to have a lot of patience with him,” whereas another parent explained “my husband doesn’t have a lot of patience for [child].” One mother was observed to imitate her child’s vocalizations during the initial interview: “And I—ba ba ba [imitating the child’s sounds during play]—and I go and I look for him...”

Parent knows child’s likes and dislikes. All of the caregivers talked about their child’s preferences for certain items and activities, as well as things that their child disliked. Parents described child’s interests in certain toys, like trains, computers, and fish toys (e.g., “...There are some weeks that he doesn’t want anything but the fishy, fishy, fishy, fishy”). Parents talked about food that their child likes and dislikes (e.g., “...he really likes rice”; “He only wants cereal”) and described activities that the child enjoys and dislikes (e.g., “...once in a while, we take [child] to the park because [child] does like parks”).

Mothers' and fathers' responsibilities, routines, and motivation within Hispanic cultures. All three families described their roles, as mothers and fathers, in their family's life. Two families also described their perception of Hispanic parents, in general. In terms of their own responsibilities, all caregivers reported that the father worked, while the mother stayed home and took care of the children. In general, the fathers' role was to work "a full-time job" to support the family, help with evening routines and chores, to be the enforcer of rules, and to watch the children while the mother ran errands. One father explained how this role was tiring and left little time for playing with his children during the week: "And, well, we're Mexican, and the dad is always work, food, and money"; "And sometimes, 'No, I'm busy, I'm working, I get home tired,' and 'No, we're going to eat dinner, bathe, and go to bed, come on kids, let's go.'" Another parent explained: "...[W]hen dad comes home in the evenings, that's his duty. Pick up the toys..."

The mothers' role in all three families was to take care of the children. As one mother explained, "I basically do everything for the boy." All three mothers described helping their children through their daily routines, such as getting ready for the day, changing diapers, preparing meals, taking children to school, bathing the children, and helping the children to sleep. All three mothers put on TV shows for their children, and one mother talked about how she played with her child. Mothers also performed other household chores, like cleaning the house and doing laundry. During these chores, the mothers needed someone to watch the children. One mother described how it was difficult to do chores if no one was available to watch the children, because the children would get in physical fights with one another or the child with ASD would have tantrums. Another parent explained that she could not run errands with the child, due to the child's difficulties in public places, "so they stay here with Dad."

The parents also talked about how they spent time together as a family. In one family, the mother and father prayed with the children in the morning, and prayed and sang together at night before bed. Another family read books to their children before bed. Two families talked about going out together, like to the mall and the park, and explained that they wanted to eat together as a family. One parent described how his family played Wii games together in the evening. As noted in the "concerns and priorities" section, the families' child with ASD had difficulty participating in many of these activities.

Finally, two families also described their perceptions of parenting in Hispanic cultures. The caregivers explained that some Hispanic parents are not aware that they "can make a change" in their child, and so do activities by themselves, rather than involving themselves with their child. One father explained: "The only thing Hispanic

television has to offer are soap operas. What benefit is there? And...the generation of those who came as immigrants, right? We continue watching Mexican television, which was engrained in us our whole lives...and from when the evening begins until the night is over, it's all soap operas. And there's no added value in that. And the children—let's see who educates them.”

Siblings' responsibilities and time with parent. All of the families talked about their other children, in terms of their children's responsibilities and/or the time parents can spend with their other children. In one family, the older sibling was occasionally responsible for watching his younger siblings. The father explained how this was a common role for siblings in Hispanic cultures, but that it could lead parents to be less involved with their children: “Yes, I mean, we've handed over the paternity to the big brother. Which is bad.” In another family, the older sibling had more chores to complete, because the child with ASD did not always help: “I tell them, ‘Boys, we're going to pick up the clothes from the floor,’ and he [child with ASD] does help, or if not, [his older brother] is the one that picks up.” As noted under “concerns and priorities,” all families also made an effort to have special time with their other children. One mother explained: “[My other child] has his time with us...For example, when there's an event at the [special event location], we only take him.”

Family's home, materials, and finances. All families discussed their comfort-level at home versus in public places, as well as their use of materials and financial resources. One family described how they felt more comfortable at home than in public places, because of their difficulty taking their child in public, but acknowledged the need to go to public places. The mother explained: “Taking him out of the house is like, ‘Ahhh, I wanna be in my house!’ All the time. And we, you know, have to go to the food store.” All three families talked about how they enjoyed going to some public places, like the park, but encountered more difficulties outside than at home. One mother talked about how the family will frequently go to the mall: “Oh, yes, we do go a lot. When his dad is here, well, we go often. Always, because he loves it so much.”

Families had different experiences with material resources. One mother explained that her child “hardly used toys.” In contrast, another parent reported using many toys with the child in an attempt to get his attention: “...I take a toy to where he is or I take several. I always play with different ones, because if I take only one and he doesn't want it, he won't play.” In terms of financial resources, one father talked about his personal finances: “Thank God I have a full-time job, so I'm outside of the poverty line...” Another parent talked about other families

she knew who had children with disabilities, but few financial resources: "...They're families who don't have resources, they don't have a computer at home. And they live in levels of poverty."

Helping and Reciprocity Stage: Non-ART

The category of "Helping and Reciprocity Stage: Non-ART" includes parents' experiences with supports and resources prior to participating in the ART intervention. In particular, supports and resources were analyzed in relation to the parents' concerns and priorities, as well as their family strengths and characteristics.

Concerns and priorities: Non-ART supports and resources. Caregivers described how supports and resources related to their concerns and priorities for their family. Themes in this category included: school-related services; other treatment programs and supports; and strategies the parent has adopted or prefers.

School-related services. All families reported that their children were receiving school-related services at home and/or at school, such as speech-language therapy and occupational therapy. These school-related services related to the following family concerns and priorities: communication and language; emotions and behavior; and need help as parents. Reflecting their concerns about communication, two families reported wanting more speech-language therapy for their children, both families indicating that, "one hour a week" was "very little." All parents talked about how their child's school-related services were provided in English, which, for at least one parent, conflicted with what language she wanted her child to learn. This parent asked if her child's services could be provided in Spanish, "but they told me at the school they give it in English." Another family explained how waiting for a bilingual therapist limited their child's progress:

"The reason we said for them to send him an American or a Chinese person, whatever, but for him to speak something, is because they had us on a wait list for six months. So we said... 'Send us a therapist. The boy is losing time.' So they said to us, 'Okay, we'll send you an American who doesn't speak anything other than English.'"

In terms of emotions and behavior, one parent reported that her child would soon be attending a special education classroom, and expressed hopes that it would help her child with his negative emotions, particularly when going places outside of the home: "[My child] gets upset when we take him out of the house...but I imagine that when he's in special education, he'll get the school routine, and so he'll have to get used to it, right?"

Finally, school-related services failed to address parents' need for help, particularly the need to know how to "handle" ASD. All families talked about how their child's services focused on the child, rather than the parent, and how little the services providers communicated with the parents, both at school and at home. The parents explained: "...you can be there, but you hardly participate"; "...all of them are about the child, the child-centered

around the child”; “I don’t even know the speech therapist at the school”; “The work with the other therapists is an individual matter... ‘Hi,’ and they sit down to play with the child, ‘Bye,’ and they leave. That’s what they do.”

Other treatment programs and supports. In addition to school-related services, families talked about other treatment programs that they had received or heard about, as well as community resources. These other treatment programs and supports included: TEACCH (Treatment and Education of Autistic and related Communication handicapped Children); vitamins and supplements; ASD support groups; and church. When compared to the family’s concerns and priorities, these supports and resources related to the following areas: brain development; emotions and behavior; academics; self-care; and need help as parents.

The family concerned about brain development reported using biomedical treatment, such as vitamins and supplements, to help their child’s brain functioning. The mother explained biomedical treatment in this way:

“The biomedical treatment is specifically nourishing your immune system in a different way, so the brain works in the best way...they send you a list of vitamins, minerals, so you can start giving them to the child, and the diet is...in order to detox the body, because they think that the gluten is what causes the swelling of the brain with autistics. So if the brain gets unswollen, the brain starts to function as it should.”

The family felt that their child’s brain functioning affected many of their other concerns, such as their child’s attention and concentration, which the parents indicated could also impact academic skills; emotions and behavior, particularly feelings of anxiety; and the child’s ability to sleep. Thus, parents felt that by addressing brain functioning, biomedical treatment could help with these other concerns, as well.

Two families indicated that their child’s academic skills were a priority. One family used biomedical treatment as an indirect way of addressing this concern, as described above, whereas the second family felt that the TEACCH program was a good resource for addressing educational concepts. The father explained: “TEACCH is...educational...for the child...TEACCH is really good for him...to have a little more mobility in his hands, color coordination, colors, letters, and games.” For concerns about self-care, this family also believed that TEACCH was a good method for helping their child with potty-training routines. The other two families used vitamins and supplements to help their child with self-care, such as giving their child Epsom salt baths and/or melatonin to help with sleeping.

Finally, church and ASD support groups were discussed as ways of providing support to parents. Church was identified as a way of making acquaintances, in general, but as a difficult way of finding ASD support, because of the child’s difficulties at church and/or the feeling that it was socially inappropriate to approach church members about ASD. One mother explained her experience at church: “I mean, I can’t be asking, ‘Do you have someone with

autism at home? Do you have autism?’ I don’t ask them that, so I don’t know.” As alternate way of gaining support and education, two families talked about attending Hispanic and/or non-Hispanic ASD support groups. One mother stated, “With me, since I found out that there was a problem, I started to educate myself and started going to the public trainings...I started going to the support group for Hispanics, Latinos. And the American one, too...we go to the American one, too, because we relate to them...” This mother explained that ASD support groups also provided a way for the whole family to interact together: “...when there are autism events, they include the siblings.... So it’s good, because there are activities for him and activities for [his brother].”

Strategies the parent has adopted or prefers. All three families described strategies that they implemented to help their child improve developmentally, citing strategies that they learned from professionals, as well as other strategies of unclear origin (i.e., without mention of learning the strategy from a particular professional). These strategies were used to address a variety of concerns, such as communication and language; social relationships; restricted interests and repetitive behaviors; attention and concentration; emotions and behavior; academics; and self-care. Families also talked about strategies that they avoided using.

Strategies recommended by professionals included the following: picture cues, signs, change the environment, and have developmentally appropriate expectations. Two families talked about adopting these strategies from professionals. One mother explained, “We basically do what the therapists do.” For example, in terms of picture cues, one family described how they used TEACCH picture cues for helping their child with potty-training routines. Another family talked about how they used signs with their child, as the speech-language pathologist suggested, but that they disagreed with their therapists about using picture cues, explaining:

“We have our own thoughts as to why we don’t want to work with images...Because we have seen that...the kids turn into, like, robots. They don’t try to talk, but rather, they go and look for the image...and they show them the images and they don’t try to speak. And I’ve told the therapists, the three speech therapists he has, I want them to make him talk. So that he can communicate with his voice, not so that he communicates through a photograph.”

Per doctor recommendations, at least one family changed their child’s bedroom environment to be more conducive to sleeping, in order to help with their self-care/sleeping concerns. One family also adjusted their expectations for their child’s development, based on what they had read and based on recommendations by their occupational therapist and speech-language pathologist. For example, the mother explained: “The only thing I have read and what the therapist advised me, as well, is that at his age, and because of the situation and the level he is at, to not to be too persistent with reading time. She told me to purchase books that are like ‘My First Words.’”

In addition to strategies introduced by professionals, parents talked about other strategies they used to address their concerns. To help their child with communication skills, parents asked the child questions, put on academic TV shows, and encouraged reading time. Parents used first-then strategies and commands to increase social interactions, reduce focus on restricted interests, and to transition to self-care activities. To help with attention and concentration, parents gave direct commands, gave their child breaks, offered their child choices, and briefly followed their child's lead before redirecting (e.g., "I go and play with him for a few seconds and then bring him back here"). Parents attempted to regulate their child's emotions and negative behaviors with first-then commands, changing the tone and volume of their voice, giving direct commands, giving their child breaks, and holding/hugging the child.

Family strengths and characteristics: Non-ART supports and resources. Caregivers talked about how supports and resources related to their family strengths and characteristics. Themes in this category included: school-related services; other treatment programs and supports; and preferences for their child's services, in general. These resources related to the following family strengths and characteristics: we're all human; parents' language and child's language environment; parent's style of communicating and playing with the child; parent knows child's likes and dislikes; mother and father's responsibilities, routines, and motivation within Hispanic cultures; and family's home, materials, and finances.

School-related services. As described above, all families reported limited communication and participation with their child's school-related service providers. As a result, even though families explained that "we're all human" and can connect to one another based on common experiences, families had little-to-no knowledge of their children's service providers and so had little with which to connect. All of the families primarily spoke Spanish, and so the fact that the child's school-related services were provided in English created another disconnect between families and their providers, particularly for the family who only spoke Spanish. One family explained that "[t]here's a lot of need" for bilingual therapy and that native Spanish-speakers, in particular, could make connections with families: "Sometimes we have certain idioms within our native Hispanic or Latino language that we simply know in Spanish...So like to know your patient perfectly, so the doctor can take the most advantage of it and produce results."

Other treatment programs and supports. In the category of their child's other treatment programs and supports, parents talked about TEACCH and the Son-Rise program. One family had participated in TEACCH in the

home, and liked how the TEACCH interventionist brought new games and materials. Another family had seen videos of the Son-Rise program, but had not participated in the intervention. The mother described her communication style as being “the one who always talks,” and so had negative perceptions of strategies where the adults waited quietly, because this seemed to conflict with how she naturally interacted with her non-verbal child: “...I’ve seen it on the videos, for example of Son-Rise programs...So I said, ‘Well, these people...[are] quiet, waiting for the child to react with a sign or something.’ And I said, ‘No, this can’t be so illogical. This must have some logic to it, right?’”

Preferences for their child’s services. Parents also discussed their preferences for their child’s services, in general. All three parents talked about wanting services that motivated the child to participate. For example, one parent described how she preferred play-based therapies, “because that way, they [the children] are more motivated to do things.” A father explained that he preferred therapy activities to focus on the child’s current environment, rather than focusing on activities from the family’s home country that are no longer applicable to the child. He explained:

“Yes, with our culture, of course, you’d have to learn, for example, the children’s nursery rhymes. But also that doesn’t apply, because our children aren’t Mexican anymore...I mean, of course, the parent is going to feel good to remember that, but it’s not going to apply to the children...And you need to be aware of that and adapt to it...I mean, why continue with something that they implemented in us almost obligatorily, when we can give them other things that are going to help improve the children more than teaching them the matachineada [traditional Mexican dance/ritual], right?”

Parents also expressed a range of preferences for how they wanted to be involved in their child’s interventions. Parents felt that it was “up to us [parents] to find out who to get in touch with,” in order to find services for their child. The families’ involvement in other programs, such as TEACCH and ASD support groups, helped connect them to other services for their child. One father explained that he wanted the professionals to take charge of the child’s intervention, because he was tired and had little energy after work, and also because he felt that the professionals had more expertise: “And sometimes...I want the teacher, the psychologist, the speech therapist, the TEACCH therapist to do everything for me.” On the other hand, some parents discussed the desire to be involved in their child’s intervention programs and to have open communication with the therapists. One mother explained: “I definitely think that if I don’t participate in my son’s life, well, enough, we’re not going to see results.” Another father explained: “...we encourage any communication with any therapist...we’ve taken the greatest interest in interacting with the therapist. But the truth is, we don’t know up to now if it exists, if it’s existed since school started...”

In terms of the parents' financial resources, two families talked about how limited income and difficulties with insurance prevented children from getting more intervention services. One father explained: "...I don't receive anything for free and therapies cost \$260 an hour. And my insurance says no. Because in North Carolina, the law doesn't ask insurers to have to cover costs for therapies associated with improving or helping autism. So that's why he hasn't been able to have more therapy."

Helping and Reciprocity Stage: ART-Related

The category of "Helping and Reciprocity Stage: ART-related" includes parents' experiences with the ART intervention. Families' perceptions of ART were analyzed in relation to the parents' concerns and priorities and their family strengths and characteristics.

Concerns and priorities: ART-related. Caregivers described how ART related to their concerns and priorities for their family. Themes in this category included the following: ART matched parents' hopes for child, but parents still have concerns; ART provided consistency; and ART provided education and support for parents. When compared to the family's concerns and priorities, these themes related to the following areas: communication and language; social relationships; restricted interests and repetitive behaviors; attention and concentration; brain development; emotions and behavior; pretend play; academics; self-care; and need help as parents.

ART matched parents' hopes for child, but parents still have concerns. All three families discussed how ART matched at least some of their priorities, and helped their child improve to an extent. However, parents continued to report concerns about their child's development. In terms of communication and language, caregivers reported that ART helped improve their child's communication in the following areas: requesting (all three families); social play (all three families); joint attention (one family); being verbal and/or more vocal (all three families); and eye-contact (all three families).

As an example of requesting, one mother described improvements in communication as follows: "I think that now [my son] has more understanding that if he doesn't make a little sound with his mouth, it's hard for him to get something from me." Another father explained: "He used to only do this...For example, if he got near the refrigerator or the kitchen and he would say 'Ah' to someone. [The adult would ask,] 'Do you want water?' Okay. And now, [the child says], 'Water, please.'"

Families also talked about ART strategies that helped their child with these areas of communication. To address requesting and being verbal, one family used *give my child frequent opportunities to make choices*; another

family reported using *wait silently for a more mature response* and *communicate the way my child communicates*. To address social play, two families described using *play face-to-face games without toys* and one family gave an example of *take one turn and wait*.

In terms of which language the child was learning, two families liked the ART program's focus on teaching Spanish. One father explained: "[We're] thankful more than anything that the opportunity exists for the Spanish language within the ART group...the more they're worked on [languages], the better results exists...it's very important. And it was a big help to us."

Despite these positive feelings, all parents reported that their child still had difficulty with communication. For example, one mother explained: "He had a bit of a hard time with [social play]...He made a little progress, but it wasn't like [requesting]...where results were seen more quickly." One parent wanted more content related to speech-language therapy in the ART program, and demonstrated confusion about the relationship between speech-language therapy and ART: "I would have liked more speech therapy—well, ART isn't about that, but I would have liked it...That's why if it [ART] would have included...all those strategies, plus speech therapy, I think that would have been fantastic."

All three families reported that their child's social relationships improved after participating in ART, in that their children demonstrated more social enjoyment and intimacy with others, and less focus on restricted interests. Parents described the most improvements with familiar people in the child's "close circle," but interactions with unfamiliar people improved to a certain extent, as well. During parent-child interactions, parents felt that the child "enjoys the play when we're playing," played more often with the family, and had less object-obsession. All parents described this improvement, but the change seemed most poignant for one father, who explained his parent-child relationship as follows:

"Now, ART is for the day-to-day coexistence. And I'd say that's what I have most valued. And I think that many of us parents haven't been able to understand that autism—the only thing the child is asking for is intimacy with the parent...because sometimes [I thought], 'No, it's just that he doesn't have feelings or affections' and all that, right? But they are there. He does—[my child] enjoys so much, and when he smiles, and he screams with laughter...that's something...which there didn't use to be."

As far as unfamiliar interactions, two families felt that that the child gained more confidence and showed more happiness with people "outside the circle," such the ART interventionist and other children. One parent described his child's interactions with other children on the playground: "It's hard for him to interact with people he doesn't know. And you try to put him in the group and he starts gaining confidence and he takes to it. So, for

example, we're at the playground, and 'Your turn, that kid's turn.'" Parents described ART strategies they used to help their child with social relationships: *take one turn and wait* (one family); *get into my child's world* (one family); *play face-to-face games without toys* (all three families); and *change the environment* (one family). Since the parents participated in parent-child free-play videos during ART, parents talked about how these recordings provided memories of these positive interactions.

Despite noting these improvements, parents continued to describe unfamiliar interactions as a concern: "...that aspect of interacting with other children, that's a matter of time. Time will tell.... It's tough for me to get there, because I know it's hard for him to interact with other people." One parent also continued to have concerns about his child's restricted interests and repetitive behaviors, explaining how the ART strategy *be more interesting than my child's distractions* was inconsistently effective at encouraging the child to socialize, rather than focusing on his obsessions: "I mean, sometimes...no matter how much you do it [use the ART strategy], it's not going to interest him."

No families described ART as addressing the child's sensory issues. However, it should be noted that the families participated in an abbreviated version of ART, which only focused on social-communication; the full version of ART also addresses sensory-regulatory concerns. One family did note an improvement in their child's attention and concentration: "[My child has] a little more concentration when he interacts, a little more—the concentration—visual—it's a lot more than what it was at the beginning, so yes, little by little we saw those improvements."

Related to the child's social-communication improvements, parents described improvements in their child's emotions and behaviors, in that the child displayed more positive and less negative emotions. One mother explained how the use of an ART strategy helped the child transition between activities "without throwing a tantrum—without crying, and that helped me a lot, yes." ART helped improve the child's negative behaviors through working on the goal of "requesting" (two families) and by using the ART strategy of *offer my child frequent opportunities to make choices* (one family). Another parent explained that ART helped him understand his child's feelings better: "Sometimes it's difficult for us to understand what he's thinking. It's very difficult for him to tell us his feelings. But on making it possible and reinforcing the communication...it's an essential path for us to understand his mood...."

ART did not directly address pretend play for any of the families, but one parent noted some improvements in pretend play after ART: “Another thing that I was telling [the ART interventionist was] that at the end of the therapies...he starts doing a little more imaginative play, the pretend play. Which is something very difficult for children with autism. He sometimes at the playground, or when he’s playing, he says to me, ‘Come.’ And he starts, ‘Water.’ And he starts to simulate—‘Pizza,’ and he starts playing pizza.” Despite these improvements, the parent felt that his child’s play was still not very imaginative and requested that ART include more activities related to pretend play. (As a note, the full version of ART does include symbolic play goals.)

In terms of academic concerns, none of the families described ART as educational for the child, per se, but one family talked about how working on joint attention helped with book activities: “Yes, because now, I can sit down with him to try to read a book, or the numbers or letters. And he does them with me. Before, he didn’t even want me to—or to be quiet.”

ART failed to address many aspects of self-care; however, the interventionist provided informational handouts upon family request, which were unrelated to ART: “Maybe once she [the ART interventionist] knew [my son’s] life a little better, I would mention to her, for example, that I had concerns that he wasn’t sleeping well, and she would bring me information—photocopies. And she would bring me [information] from ‘Sleeping Troubles’ [*Strategies to Improve Sleep in Children with Autism Spectrum Disorders: A Parent’s Guide* by the Autism Speaks Autism Treatment Network].” One family indicated that ART indirectly addressed potty-training by working on communication: “But what we could discover during that time was that he now tells us, ‘Poopy.’ When it’s already done. And before, he didn’t say anything. Right? So now, at least 50 percent is already attained. We need the physical part of, ‘Oh, before it happens—I have to go.’ We still haven’t gotten to that... It’s getting close.”

ART provided consistency. For the family concerned about brain development, the mother reported that she would continue to implement ART because of this concern: “I’m going to continue...because I know that the brain of a child with autism tends to forget, and I don’t want him to forget to ask me.” This family also valued the consistency of ART, since the parent can steadily implement strategies during critical periods of brain development. The father explained: “So there are certain things that need to take place within a certain time period. From three to five years you can see big progress, so there’s the possibility that the boy or girl...can reach a normal level when he reaches the age of 11, 12 years old. But that requires a lot of care, dedication, and work. And if we as parents didn’t carry it out, and if we left it entirely up to a therapist...so we want to see results.”

ART provided education and support for parents. Finally, a major component of ART was that it provided education and support to all of the families, addressing the parents' need for help. The parents explained this benefit of ART in many ways:

“What most struck me was that it’s an education for the parents. I mean, they teach us how to interact with our son to help him. That’s the most important thing.”

“The others [other therapies] are good, but I see this one as being a lot better, because they show you how to help our children.”

“...I had gotten interested in this [program] a lot, because it’s like working with the parent. And...I think this is the only one...And I would say to her, above all, because we’re parents recently diagnosed, so we’re new to this world, sometimes information [is over your] head, other is quite vague. So you don’t know how to handle this, and for someone to come and show you—for me that’s wonderful. It’s the best.”

“It was a great source of support to us.”

Family strengths and characteristics: ART-related. In addition to concerns and priorities, parents explained how ART related to their family strengths and characteristics. This category included the following themes: the only option we have as parents is to participate; ART encouraged teamwork; family is immersed in ART, but some ART strategies did not feel natural; other parental responsibilities created obstacles; and use of parents' home, materials, and finances. These themes related to the following family strengths and characteristics: we're all human; parents' language and child's language environment; parents' style of communicating and playing with the child; parent knows child's likes and dislikes; mother and father's responsibilities, routines, and motivation within Hispanic cultures; sibling's responsibilities and time with parent; and the family's home, materials, and finances.

The only option we have as parents is to participate. As indicated by the first theme, all three families felt that it was their responsibility, as their child's mother and father, to participate in their child's ART intervention, despite the obstacles they encountered. One parent explained: “...I think the only option we have as a parent is to do them. To implement them [ART goals and strategies].” For the mothers, taking on this role seemed like a natural extension of their responsibilities, as well as their desire to participate in their child's other therapies, since they were the primary caregivers for the child. One mother explained: “And the therapists, due to health insurance matters, due to reasons sometimes, they're not always going to be there. So who better than the mother? To be in charge of him. So, yes, in that way, I do think that it's [ART's] been a good thing for us.” Unlike the mothers, the fathers did not have this role prior to ART, since they were the primary bread-winners and expressed a desire for professionals to be in charge of the child. However, both fathers who participated in the post-ART interviews

emphasized the importance of being involved in their child's intervention. One father explained this change in perspective as follows:

"I have to do this to help him. I mean, I can't be an observer. I have to be a participant...It's what has most struck me. That I have to involve myself with my child...which we sometimes don't even do with neurotypical children...But now I think that's what we need as parents of children with autism: to understand that we need to go inside that world. And to start that coexistence."

This father also advocated for ART to be implemented with other Hispanic families, based on his perspective that parents in Hispanic cultures are sometimes unaware that they can help their child in this way: "I would like for it [ART] to be implemented with every Hispanic family...to promote it or something. That the parents need to get involved with their children. And I'm talking about the male parent, that is, the father. Not the mother, because the mom is the poor one who's always involved, right?" Another parent echoed this point of view: "I think that the program also gets into the parents' minds and tell them, 'You can make a change in your child.'"

ART encouraged teamwork. Going along with their desire to be involved, parents indicated that ART encouraged teamwork, and so not everything was left to either the parent or clinician. For example, families talked about how the clinician came with prepared information in Spanish, which helped the parents to understand the material, and then requested the parents' feedback. Parents made treatment decisions and recommendations based on their child's likes and dislikes, such as how long a treatment session should last and when they practiced the ART strategies. One parent explained this idea as follows: "It's just that the work with [the ART interventionist] is like a group. The work with the other therapists [e.g., speech therapy] is an individual matter." Another parent explained: "We work on that as a team to achieve it."

All parents who primarily participated in the ART sessions reported that they spent almost every day practicing. They indicated that the session time was used effectively and felt it was important to practice strategies every day to reinforce them: "I do feel that some things that she [the ART interventionist] read to me, I felt that they needed to be reinforced. Not just to have thought about them, but...put into practice daily." All families practiced the strategies during routines, which, according to one parent, made it easy to practice the strategies every day: "The frequency was every day, because it was within his routines...So if he eats dinner, there were some strategies that could be done during dinner...It seemed very easy to me, because, well, it's within the boy's routine." Despite the parents' appreciation for being involved and time spent during ART, one parent still wanted professionals to occasionally take a larger role: "I mean, sometimes we want the therapist to do everything."

Family is immersed in ART, but some ART strategies did not feel natural. All three families described how, in one way or another, they were “immersed in what we should do through ART”—in other words, certain ART strategies felt natural and “easy-to-do” for families, even if the targeted behavior was difficult for the child. As noted above, because the strategies could be practiced in family routines, they seemed more natural to the parents; families also reported that strategies felt natural if they addressed parent concerns, went along with how the parent already played with the child, or if the strategy made sense to the parent. Parents felt that since “we’re all human,” they could relate easily to the ART program, regardless of being from Hispanic or non-Hispanic cultures. One mother explained: “Basically it wasn’t a big deal. It’s the way I play with him” and “Well, a lot of things that were discussed...she would read them to me, and suddenly I would say, ‘Jessica [ART interventionist], I feel the same way, did I not write that blessed book?’”

Parents also showed other family members how to use ART strategies, such as siblings and one grandmother, and described the importance of multiple family members helping the child. One parent described the older sibling using ART strategies as follows: “[H]e [my older child] does say to him, ‘Wait your turn, my turn.’...They’re outside. ‘Bike or ball?’ The family starts integrating into the way of communicating.” Another family explained the importance of educating “the parents and the siblings...everyone who could provide something to this boy or girl.” One grandmother also participated in ART sessions: “And another thing is that he really likes social play with my mom, because he really likes to be tickled...And my mom would say to him, ‘Tell me something,’ and he’d go, ‘Ti,’ and she’d say, ‘Okay, I’ll tickle you now’...and my mom put them into practice.”

Strategies that families spontaneously used during the post-ART interview or that they described as feeling natural included the following: *Give my child frequent opportunities to make choices* (two families); *communicate without asking questions* (one family); *take my turn and wait* (one family); *wait in silence for a more mature response* (two families); *change the environment* (one family); *play face-to-face games without toys* (all three families); *get into my child’s world* (one family); *follow my child’s focus of attention* (one family); and *communicate the way my child communicates* (one family).

Families reported that some ART strategies did not feel natural or that they would not use some ART strategies every day. However, the discussion points (i.e., rationale for the day’s lesson) and seeing the child’s progress helped parents keep practicing strategies that otherwise felt unnatural. One father explained the importance of discussion points: “But when it’s explained to us in such a way, we [realize]...it’s not, like, simply something that

needs to be done, but something that has a significance.” Another parent explained how her style of communicating with the child (i.e., the mother is “the one who always talks” because the child is “nonverbal”) sometimes clashed with ART strategies (e.g., *wait silently for a more mature response*), but seeing the child’s progress encouraged her to keep using the strategies:

“For instance, when we got to that part about waiting in silence—that’s very tough for him. Because to start off, they’re not verbal, right? And to keep quiet? Oh...sometimes I felt angry...And those little parts took us like two weeks to adapt ourselves to not—in silence, while he responded to what we wanted. But there, you know, like, sometimes I had my doubts. Like, ‘Oh, [we’re] wasting time here.’ But no, in the end, we did see that he responded and he adapted quickly.... That was the important thing.”

Strategies that parents noted felt unnatural, had difficulty with, and/or that they would not practice every day included: *communicate without asking questions* (one family); *change the environment* (one family); *communicate the way my child communicates* (one family); and *wait silently for a more mature response* (one family).

Other parental responsibilities created obstacles. In addition to strategies that felt unnatural or difficult, parents’ other responsibilities created obstacles for participating in ART sessions and practicing ART strategies. The father’s work schedule was an obstacle to attending ART sessions and practicing strategies in all three families. Since none of the mothers worked outside the home, they generally did not encounter these difficulties, except for times when they needed to run errands or provide childcare for their other children (two families). For example, one mother explained: “I think there were one or two strategies that I didn’t have time for, because I wasn’t at home. I had to go out and I didn’t have the chance to practice them.” However, the parental attitude that “the only option we have as parents is to [implement ART]” overcame these obstacles to a degree, for both mothers and fathers. One family did request to end the ART intervention early due to undisclosed “personal problems,” suggesting that there were other events in the family’s life that made it difficult to continue practicing ART, despite their best intentions.

Use of parents’ home, materials, and finances. Finally, parents talked about how their home, materials, and finances were used during ART. All three families liked how ART sessions occurred in the home and the neighborhood park. One family felt more comfortable at home, because of the child’s difficulties with public places: “It was very important to be able to do it at home, at the house, because his comfort zone is a surrounding he already knows, he’s familiar with things that he likes. So it was a good starting point...” Another parent preferred being at home, “because mainly I can’t drive—and, well, because I feel more comfortable here at home.” The fact that the parents were video-recorded created some discomfort for families. One mother explained: “And I said, ‘Oh my

God,' tick, tick, tick. And the video is there running.” When asked about this issue, one father felt that the parents’ motivation to help their child succeed would overcome the discomfort of being video-recorded: “...you’re prepared that this has to improve—no matter what.”

Families also had different perspectives about how their materials were used during ART sessions. One mother naturally used many toys with her child prior to the ART intervention, describing how she used multiple toys to keep their child’s attention. The mother felt comfortable using these same materials during the ART intervention: “It wasn’t a big deal, you didn’t need an instrument you had to go buy elsewhere. I have everything here at home, and with the first goals that were for asking...we have a lot of toys here.” However, after the ART intervention, the mother also reported a change in perspective about using objects with her child: “It changed...it’s okay, you don’t have to be playing guitar all the time, and we don’t have to playing with cars all the time. It’s okay for you and me to play. I mean, like just looking. Looking at and touching each other. But it’s okay. We don’t need anything else to be happy. Just you and I. And I do thank the project for that.”

A second mother described how her family rarely used toys with their child. When asked if the ART intervention seemed appropriate for Hispanic cultures, she replied, “Yes, because...for example, like where you play without toys. I think that’s good for me, because out in your home country, you never had toys.” In contrast, one father felt limited by the materials they had at home, and felt like he needed more ideas knowing how to implement the strategies with his child. He recommended that the ART intervention include more prepared activities and materials, like in TEACCH: “[I would like them to bring] specific games. ‘Today we’re going to play this,’ and bring some materials. For example, TEACCH. Like that.... And here it was more free.... Sometimes I’d run out of ideas. So I think that is something that could be improved for the next implementation.”

Parents made use of their material and financial resources to foster their understanding of the ART material, such as by searching information on the Internet and planning to buy the Responsive Teaching manual; however, one family noted that the ART intervention could be an option for low-income families: “So if they were instructed through this course, they could put it into practice in their own home. And they could be the primary therapists to carry it out with their children. And it would be a good starting point for them.”

Post-Helping and Responsiveness Stage: ART

The “Post-Helping and Responsiveness” stage includes parents’ overall perceptions of the ART intervention, based on their experiences during the “Helping and Reciprocity” stage (i.e., how the ART intervention

related to their concerns and priorities and family strengths). This category includes the following themes: positive view of clinician-parent interaction; recommendations for promoting ART; and feeling grateful and happy about participating in ART.

Positive view of clinician-parent interaction. All three families shared positive viewpoints about their clinician-parent interactions, indicating that the relationship was comfortable and that they trusted the clinician's expertise. Families indicated that the following factors created a comfortable relationship: the clinician's use of Spanish, which helped with family understanding; the clinician's professional, yet personal approach to the child and the family, which related to the families' perspective that "we're all human"; and the encouragement of parent feedback and questions, which related to parents' motivation to participate as a team during ART. For example, one mother explained: "...there was that confidence to be able to say, 'I don't understand what you're saying....' And she'd go back and explain it to me." As another example, a mother and father explained the importance of a personal approach and connecting on a "human" level:

Father: "More warmth, like—"

Mother: "Yes, she's like more—"

Father: "—more humane.... An approach not so technical, rather more personal."

Mother: "Yes...you feel that she wants to help you as a therapist and she really devoted herself to [my child]."

Recommendations for promoting ART. Two families also recommended that ART be promoted to other Hispanic families, particularly the idea that parents should get involved with their children, based on the needs they observed in these parents and children. Suggested ways of promoting ART included: Hispanic television, Hispanic radio, newspapers, pamphlets, and social media sites like Facebook.

Feeling grateful and happy about participating in ART. Overall, all three families expressed gratitude and happiness about participating in ART and learning new information, which addressed their needs, as parents, as well as their child's needs. One mother explained: "I learned it. I'm always going to do that." Another parent echoed this idea: "...that program is excellent. It's better than good...I want to learn more."

Discussion

The purpose of this study was to explore the acceptability and feasibility of the parent-mediated ART intervention (G. T. Baranek et al., 2015), for three Spanish-speaking families of preschoolers with ASD. ART is a program designed to increase parent responsiveness in order to improve children's social-communication. The families had recently completed ART during a single-case design study; the results of the parents' and children's

intervention performance are reported in a separate paper (Kinard & Watson, in preparation-b). In their pre- and post-intervention interviews, families discussed their concerns and priorities for their child and themselves, family strengths and characteristics, experiences with non-ART interventions, and experiences with the ART intervention.

Before discussing the results, there are several limitations that warrant consideration. First, the small sample size limits how much the results can be generalized, particularly since all of the families were all living in the same area in North Carolina. Furthermore, two of the families were acquaintances and all of the families were part of the Autism Society of North Carolina. Based on their similar experiences, their viewpoints may provide a narrow picture of how Hispanic caregivers in the larger population would respond to ART. Another limitation is the possibility that parents provided post-intervention answers that they felt would be respectful or expected of them, even though we attempted to avoid this possibility by recruiting a native Spanish-speaking interviewer who had not participated in the intervention. Because of these limitations, the results should be considered exploratory. To our knowledge, however, this is the first study exploring the early intervention beliefs of Hispanic families of children with ASD. The results create a starting point for future studies, and also offer insights to both clinicians and families as they make decisions about early intervention programs.

To begin, all families in this study felt that, overall, ART was feasible and acceptable. In previous studies focused on parent responsiveness interventions, parents have also reported high satisfaction with the program (Carter et al., 2011; Freuler et al., 2013), for both parent and child outcomes (Donaldson, Elder, Self, & Christie, 2011). In the current study, several factors seemed to influence the parents' perceptions of ART and other interventions. These factors aligned with components of the Family-Systems Intervention Model (Trivette et al., 2010) and included: (a) the families' concerns and priorities; and (b) their strengths and characteristics, as a family. Below, the discussion examines some of these findings in the context of previous literature.

Concerns and Priorities

Many of the parents' concerns and priorities were addressed by ART, contributing to their positive feelings about the program. Despite noting improvements, however, families still felt concern about their child's development and expressed the desire for continued intervention. Some of the primary concerns that ART addressed included: the child's communication and language, social relationships, emotions and behavior, and the parents' need for help.

In terms of communication and language, all families described that their child made improvements in communication over the course of the ART intervention, but that they still struggled with communication skills. One father recommended that future versions of ART include “speech therapy” strategies. This recommendation is important, because it suggests that the father views ART and speech-language therapy content as two different domains, despite the fact that ART targets goals within the scope of speech-language pathology (i.e., social-communication) and uses strategies often employed by speech-language pathologists, such as following the child’s lead and communicating without asking questions (e.g., DeThorne, Johnson, Walder, & Mahurin-Smith, 2009; Weitzman, 2013). It would be beneficial to add a learning module to parent-implemented interventions, explaining how the intervention overlaps with other therapy programs. This type of module could help parents make decisions about which programs they want to pursue, based on the similarities and differences across interventions. The father’s recommendation also suggests that ART could be strengthened by including additional material. Speech-language therapy content overlaps with ART, as described above, but there are clearly many speech-language techniques and goals not included in the ART program. From this father’s viewpoint, ART content, while beneficial, is not sufficient for fully addressing his son’s speech and language needs.

Another common priority across parents was the language they wanted to target in their child (i.e., Spanish and/or English); however, all parents expressed different perspectives on this issue. Among other cultures exposed to two languages, the literature reports a variety of language-learning preferences, similar to the parents in the current study (Hambly & Fombonne, 2012; Yu, 2013), as well as similar reasons for why a certain language is targeted in therapy. In the United States, families have encountered limited intervention services in Spanish for children with disabilities (Puig, 2012), as well as in Chinese for children with ASD (Yu, 2013), influencing the choice of English as a language target. Mothers have also chosen language targets based on the necessity for their child to speak English or Chinese to function in society and at home (Yu, 2013).

Importantly, across the current study and several others, families felt worried about bilingual “confusion” and/or encountered this perspective in professionals—the fear that the child with disabilities would be confused when learning both English and a second language (Bird, Lamond, & Holden, 2012; Puig, 2012; Yu, 2013). Despite these fears, investigations report no negative effects of exposing children with ASD to two languages (Bird et al., 2012; Hambly & Fombonne, 2012; Petersen, Marinova-Todd, & Mirenda, 2012; Valicenti-McDermott et al., 2013). In some cases, studies have discovered benefits of dual-language exposure, such as learning both languages (Bird et

al., 2012; Petersen et al., 2012), demonstrating larger total vocabularies (Petersen et al., 2012), producing more gestures, and engaging in more pretend play than monolingual peers with ASD (Valicenti-McDermott et al., 2013). Other benefits of targeting the family's native language would be to capitalize on the parents' rich language knowledge, as well as to foster the child's cultural heritage and establish strong connections among family members (Puig, 2012; Yu, 2013). Another important finding from Yu (2013) is that when parents were taught strategies to help their child with ASD, mothers felt more confident in speaking Chinese to their child, since addressing their child's social-communication was something that could be done in any language (Yu, 2013). This finding suggests that parent-implemented interventions, such as ART, could potentially ease parents' worries about confusing their child and help them focus on the underlying difficulty of social-communication.

In addition to communication and language, parents reported that their child's social relationships were a priority and improved to a certain extent after ART. Scholars have pointed out that, for some Hispanic caregivers, parent-child play interactions are not a priority (Langdon, 2009). In contrast, parent-child play interactions were of considerable importance to the Hispanic caregivers in this study, and were a large reason why the parents valued the ART program. After ART, the parents felt that their child interacted with them more often, and showed more positive and less negative emotions during this play. These positive interactions helped parents feel more connected to their child. These findings indicate that generalizations about Hispanic parenting values are not applicable to all Hispanic families, and highlight the unique needs of families of children with ASD. In comparison, other studies have also described improved parent-child interactions after participation in a parent-responsiveness intervention (Donaldson et al., 2011). For future investigations and based on the qualitative improvements noted in these parents, it would be interesting to conduct an intervention study examining the affect, empathy, and social motivation of children with ASD after participating in a parent-responsiveness intervention.

For one family in the current study, brain development was of utmost importance and seemed to influence many of their intervention decisions. Their belief seemed to create a sense of urgency, implying that the family needed to work as hard as they could now, so that the child's brain would develop during the early childhood years, giving him the best chances of normalcy in the future. Researchers have found similar feelings in other cultures, such as Indian (Desai, Divan, Wertz, & Patel, 2012), Southeastern Asian American (Luong, Yoder, & Canham, 2009), and Canadian parents of children with ASD (King et al., 2006). In these studies, parents progressed through phases of how they reacted to ASD. In early phases, parents felt a sense of urgency about overcoming their child's

difficulties; however, in later phases, they seemed to relax in their views about therapy, instead focusing on creating a “happy” life for their child (Desai et al., 2012; King et al., 2006; Luong et al., 2009). Viewed in this context, the families in this study were in an early stage of their ASD journey, particularly one family whose child was diagnosed only a few months prior to participating in ART. In several ways, ART seemed to address this family’s concerns about brain development, contributing to the family’s positive feelings about ART. For example, the family seemed to prefer parent-implemented interventions, because the parent could practice strategies with the child more frequently and over a longer time period.

A final, but crucial, concern of all families was that they needed help, as parents, knowing how to support their child with ASD, particularly since their children were young and recently diagnosed. In the past, scholars have speculated that a “focus on parent interaction skills...[would be] of less value” in Hispanic cultures, since siblings often take on a caregiving role (van Kleeck, 1994, p. 69); however, it seems that in the case of parenting a child with ASD, caregivers feel a great need for help with parent interaction skills. This feeling has been found in other parents around the world, such as in Bendouin parents of children with developmental disabilities (Manor-Binyamini, 2011) and in white American and African Canadian parents of recently diagnosed children with ASD (Patterson & Smith, 2011). In the current study, all families felt that ART addressed this concern by showing them “how to help our children,” and expressed their gratitude for receiving this support.

Previous studies have also found that parent-implemented interventions addressed parents’ need for help, but that parents continue to need help after these interventions have ended. In a pilot study of the ART intervention, non-Hispanic families in North Carolina reported valuing the support of their ART interventionist (Freuler et al., 2013). As another example, the parent-implemented version of the Early Start Denver Model has been shown to benefit parent stress levels (Estes et al., 2014). On the other hand, after participating in the More Than Words program, parents reported the continued need for more information and emotional support (Patterson & Smith, 2011). In another study, when parents of children with ASD felt a great deal of personal control, they also tended to feel more burdened and overwhelmed, suggesting that parents benefit most from a balance of personal control and outside support (Dale, Jahoda, & Knott, 2006). Thus, parent-implemented interventions, like ART, may be beneficial for addressing parents’ needs for help, but practitioners should continually assess parents’ feelings, so that the information is provided at a good pace, and so parents do not feel overwhelmed by the information or

expectations put on them. Parents of recently-diagnosed children, in particular, may need extra supports coping with the diagnosis (Patterson & Smith, 2011).

Family Strengths and Characteristics

In addition to concerns and priorities, parents formed positive opinions about ART because of how it incorporated many of their strengths and characteristics as a family. Overall, the families felt that ART was practical, easy-to-implement, and relevant to their lives, for several reasons: (a) the information was provided in their native language; (b) for the most part, the strategies went along with how the parents naturally played with their child; (c) the clinician involved the parents as teammates, and so the parents felt included and were able to make decisions about intervention; (d) other family members could be involved in the program, such as siblings and grandparents; and (e) the parents could practice the strategies at home, during their daily routines, and using their own materials, which helped make the program affordable, made both the parents and the child felt comfortable, and allowed the family to practice relevant activities.

These findings are important in the context of previous literature, which has raised concerns that parent-responsiveness interventions might clash with the traditional parenting styles of Hispanic families (Langdon, 2009; van Kleeck, 1994). Contrary to these speculations, the parents in this study agreed with the ART concepts and found that many of the strategies felt natural and relevant to their lives, with one parent joking that she could have written the manual herself. Interestingly, strategies identified as natural and easy-to-implement were not the same across all families; some caregivers viewed a particular strategy as one they would frequently use, whereas others named that same strategy as one they would not use as frequently. These differences emphasize the importance of viewing each family individually and tailoring the intervention to the family's unique strengths and preferences.

Despite these overall positive feelings, families noted barriers to participating in ART. Not all of the ART strategies felt natural to parents and, even if strategies were easy-to-use, parents sometimes had other responsibilities and life events that made it difficult to participate in the intervention. All families overcame these barriers to some degree due beliefs about parental responsibility, and also because it was rewarding to see their child's progress. For example, one mother described feeling "angry" when first working on an ART strategy that did not seem logical to her, but then felt better about the strategy when she saw her child's improvements. In a study of Hanen's More Than Words, parents also reported feeling frustrated when they did not understand the rationale behind strategies, emphasizing they would be "persistent" if they better understood "why we need to do all these things" (Patterson &

Smith, 2011, p. 336). Across both studies, these comments emphasize the importance of: (a) understanding a parent's natural interaction style with his/her child; (b) discussing the parent's comfort-level in using a particular strategy; (c) explaining the logic behind the strategy; and (d) making observations on how the strategy is changing the child's behavior, so that the parent feels motivated to continue practicing.

For one family, comfort-level using personal materials also created a barrier to practicing ART strategies. Most of the families appreciated being able to use their personal materials during the intervention, but one parent requested extra support during ART sessions in the form of prepared games and materials. This finding is similar to another study of a parent-responsiveness intervention, where parents reported needing additional support, particularly for understanding what to do after the program had ended (Patterson & Smith, 2011). Families may feel the need for more structure as they learn more strategies and target more goals. The more information parents learned during ART, the more decisions they had to make about: (a) which behavior to target, and (b) using what strategies. Even with a written plan, ART requires continual changing—observing the child's behavior and responding with a particular strategy and goal in mind. For example, the strategy *follow my child's lead* makes it difficult to plan specific games ahead of time, because the activity will be determined by the child's current focus of attention. Strong scaffolding is essential for families as they learn to implement the strategies. Particular attention could be paid to the “family action plans” at the end of each session, making sure that the families feel comfortable practicing between sessions and deciding on specific activities to practice.

In an effort to make a program culturally relevant, practitioners might suggest “family action plans” that include cultural activities, like traditional songs and nursery rhymes. One father in this study opposed this idea, however, preferring activities related to his child's current environment in the United States. This attitude reflects a counter-cultural trend for this family, where they were adopting mainstream customs in place of traditional Mexican ones (Selin, 2014). A collection of Latino folklore describes this process of losing tradition: as Latino families adopt customs of the United States, they may gradually lose traditional children's songs and games; however, it is possible that the mainstream culture could adopt these songs and games into the dominant language and activities (Herrera-Sobek, 2012). Despite this father's counter-cultural perspective, he and his wife spontaneously incorporated Mexican songs into their child's social play, such as traditional hand-clapping and circle game songs. Background knowledge is an important component of learning and participating in therapy programs (Puig, 2012); therefore, if parents' knowledge of face-to-face child games involves traditional songs, these activities may be a natural and easy

way for the parents to participate. Clearly, however, each family is different. The father's counter-cultural perspective, juxtaposed against his family's knowledge of traditional games, emphasizes the importance of discussing the family's preferences for therapy activities.

One family in ART encountered barriers to participation due to "personal problems." This mother did not explain specifically what prompted her to participate less frequently, but there seem to be several possibilities. This family also had another son with ASD and was receiving therapy several nights per week. Therefore, this mother may have felt that, ideally, it was appropriate for ART to occur two times per week, but that, practically, she and her family felt tired from their busy therapy schedule. Other parents of children with ASD have reported this experience, describing how they stopped private therapies so that their child could relax after school (Luong et al., 2009). On the other hand, whatever undisclosed problems the family was facing could have made it difficult for them to participate in ART, regardless of their busy therapy schedule. It is also possible that this mother was being polite when answering the interviewer's questions, by agreeing that the ART schedule was appropriate. This type of polite response has been reported for some families from traditional Hispanic culture, where families may sound like they agree with professionals, but are simply showing respect for the person's authority (Harry, 2008).

All three fathers in the current study seemed to face more barriers to participation than the mothers, due to work schedules. These findings are important in the context of past literature. Hispanic fathers traditionally are less involved with their children and more focused on their role as a provider (Selin, 2014). Fathers of children with ASD, in general, have expressed a desire to participate with their child, but may encounter difficulties, due to traditional parenting expectations, work schedules (Patterson & Smith, 2011), or not knowing how to relate to their child (O' Halloran, Sweeney, & Doody, 2013). Historically, fathers have been excluded from early intervention and ASD research, with most research focusing on mothers as the primary participants (Flippin & Crais, 2011). In turn, because of the father's limited involvement in early intervention, the mother may feel overwhelmed, mother-father relationships may be strained (Divan, Vajaratkar, Desai, Strik-Lievers, & Patel, 2012; Luong et al., 2009), and the child with ASD may not form as strong of an attachment to the father as the mother (Grzadzinski, Luyster, Spencer, & Lord, 2014). However, involving the father in early intervention could lead to unique benefits for children with ASD, such as development of language and symbolic play (Flippin & Crais, 2011). Other parent-implemented interventions have been successful at involving fathers of children with ASD, such as the Father-Directed In-Home

Training (FDIT) intervention (Donaldson et al., 2011). Similar to the current study, fathers who participated in FDIT reported feeling more involved and having a closer relationship with their child (Donaldson et al., 2011).

Based on these findings, it is important for early intervention providers to discuss both parents' desire to participate and make plans to accommodate their schedules. Although it may be more common for mothers to participate in a child's early intervention, it should not be assumed that the father does not want to participate. Indeed, in the current study, one father argued for all Hispanic fathers, not just mothers, to become involved with their child with ASD. This perspective reflects the counter-cultural trend occurring in Hispanic parenting, where fathers are gradually taking on roles traditionally reserved for mothers (Selin, 2014).

In addition to their perspectives on mother and father roles, two families in this study expressed views about Hispanic parenting, in general, both sharing the concern that Hispanic parents are sometimes unaware that they, personally, can help their child with ASD improve. This observation perhaps reflects that concept of *fatalismo*, or believing that a person's fate cannot be changed (Mandell & Novak, 2005; Olivares & Altarriba, 2009). Based on their experiences, the parents felt that ART could empower Hispanic families to take action, and recommended that the intervention, especially the idea of parent involvement, should be promoted to the Hispanic community, such as through Hispanic television, radio, newspapers and social media. These suggestions validate the families' acceptance of the ART intervention and also have implications for public awareness initiatives.

Conclusion

In summary, the Spanish-speaking families in this study found ART to be a feasible and acceptable intervention for their child with ASD, and felt it would be appropriate for other Hispanic families, as well. The ways in which ART addressed their concerns and priorities, as well as incorporated their strengths as a family, worked collectively to create positive feelings toward the intervention and the interventionist, despite speculations that this type of parenting intervention might not apply to Hispanic culture. As found in other studies (e.g., Desai et al., 2012), it appears that these parents were similar to many other parents of children with ASD around the world, particularly those whose children are recently diagnosed, and that the families' language and culture added richness to the ART program. During early intervention, it may be less important for a clinician to share similar cultural perspectives with the family, and instead to remember that "we're all human" and to connect with each other by demonstrating family-centered principles: respecting the family's viewpoint, empowering them to make decisions, and offering a program that is relevant to their lives (Dumas et al., 2008; Dunst et al., 1988; Trivette et al., 2010).

CHAPTER 5: CONCLUSION TO THREE STUDIES OF PARENT RESPONSIVENESS TO CHILDREN WITH OR AT-RISK FOR ASD

This dissertation examined the topic of parent responsiveness in three studies. The first study provided insight about a rating system versus a coding system, and how these measures capture the domain of parent responsiveness to infants at-risk for autism spectrum disorder (ASD). The second study produced findings in support of a parent-responsiveness intervention, used to enhance the social-communication of Hispanic toddlers and preschoolers with autism. The third study extended these findings with qualitative methods, indicating that, although cultural differences likely exist between families and parent-responsiveness programs, family-centered principles can help create an intervention that is feasible and acceptable to culturally and linguistically diverse families. Taking a cue from the qualitative study, themes were explored across all three investigations. The following patterns are discussed below: the Adapted Responsive Teaching (ART) intervention across cultures; affect; and future research.

Adapted Responsive Teaching (ART) Across Cultures

A primary theme in the dissertation is that the Adapted Responsive Teaching (ART) intervention showed success across cultures: (a) among non-Hispanic caregivers of infants at-risk for ASD, the first study found significant differences between parents in the intervention and comparison group, in that the intervention group produced higher responsive behaviors after participation; (b) the second study found moderate evidence in support of ART for improving social-communication in young children with autism from Hispanic families; and (c) the third study found that ART was highly valued among the parents of the children in the second study. Together, these findings suggest that ART is beneficial for some child and parent outcomes, in both non-Hispanic and Hispanic families. The potential cross-cultural benefits of ART is an important finding, given that scholars have doubted whether this type of intervention would be successful in culturally diverse families (van Kleeck, 1994, 2013).

The third study provided at least two reasons for the cross-cultural success of ART: (a) shared experiences of families with a child with ASD; and (b) family-centered principles. First, the participants explained that “we’re all human,” or that having a child with ASD creates a shared experience (i.e., the culture of being a parent of a child with autism), allowing parents to connect with each other despite other differences. For example, one family talked about attending both Hispanic and non-Hispanic autism support groups, due to this shared experience. As another

example, all caregivers reported concerns and family dynamics that were similar to non-Hispanic families in past research studies, such as: (a) feeling a sense of urgency about addressing their child's development (Desai et al., 2012; King et al., 2006; Luong et al., 2009); (b) needing help as parents (Freuler et al., 2013; Manor-Binyamini, 2011; Patterson & Smith, 2011); and (c) the type of role parents have with their child with ASD (Flippin & Crais, 2011; Patterson & Smith, 2011). Thus, although parent-responsiveness interventions have been developed and primarily studied in non-Hispanic, English-speaking families, these interventions have also been developed for families of children with ASD, specifically, making them applicable to the broader culture of parenting-a-child-with-ASD.

Another possibility for ART's success across cultures is the use of family-centered principles (Dunst et al., 1988; Trivette et al., 2010). Despite the shared experience of parenting a child with or at-risk for ASD, cultural and linguistic differences existed between the parents in the first study (i.e., non-Hispanic, primarily English-speaking) and the parents in the second and third studies (i.e., Hispanic, primarily Spanish-speaking). The use of family-centered principles likely allowed families to make ART applicable to their personal circumstances. For example, in the third study, ART addressed many of the parents' concerns, such as their child's communication skills and social relationships, while also incorporating their strengths as a family, such as practicing strategies in the family's daily routines, and involving parents, siblings, and grandparents as teammates.

Although ART demonstrated success across cultures, the third study suggested that ART could be further studied and modified to meet the needs of Hispanic families. Examples of these possible modifications are as follows: (a) promoting ART via Hispanic television, radio, and social media, particularly the idea that parents—both mothers and fathers—can make a change in their child with ASD; (b) educating the Hispanic community, in general, about ASD, so that parents can find support in their extended families, friends, and community; (c) finding a way to make parent-mediated interventions accessible to Hispanic fathers and fathers in general; and (d) keeping the option of providing ART in Spanish, a modification that was made for the dissertation.

Affect

A second theme across all studies was the idea of “affect” or emotional connection. In the first study, we discovered that “verbal responsiveness” (i.e., follow-in utterances), as measured by the Parent Responsiveness Coding System (PRCS), was significantly and positively related to both “responsivity” and “affect,” as measured by the Maternal Behavior Rating Scale (MBRS; Mahoney, 1999; Mahoney et al., 1986). It appears that parents who

were verbally responsive also tended to be animated and warm with their children, and that parents who were less involved or more directive tend to show less enjoyment during the interaction. In the third study, the families provided possible explanations for this phenomenon. One parent described how, before ART, it seemed like sometimes his son lacked feelings and affection, and that their parent-child relationship was distant. Per parent report, this relationship improved after the father learned responsiveness strategies and was able to create an environment where his son “smiles, and he screams with laughter.” Based on this example, it seems logical that parents would demonstrate more affect as they become more responsive: perhaps parents struggle to interact with a child who seems distant and indifferent, but responsiveness strategies help the parent and child connect with one another and share excitement. Another possibility is that the “responsive teaching strategies” taught in ART often include both qualities of “affect” and “responsiveness,” so as parents are learning to be more responsive, they are also learning to show more affect.

The single case design study (SCD) also adds a small piece to this theme of “affect.” We added the construct of “affect” to the PRCS as part of this dissertation, in an attempt to code parents’ animation and warmth while simultaneously coding their responsiveness. Unfortunately, the coders’ reliability was low and so these data were not included in the analysis. It would have been interesting to determine if the qualitative feelings described in the third study could be captured quantitatively in the SCD, but clearly more examination of how best to measure “affect” is warranted. Perhaps this construct is best measured using a rating scale, as with the MBRS, instead of a behavioral coding system; however, a coding system might be preferable, assuming coders can achieve reliability, because of its greater sensitivity at capturing group differences in responsivity, as was found in the first study.

Future Research

Finally, each study created the stepping stones for future research. A primary area of future research is to take this dissertation to the next step, continuing the efforts to make early ASD intervention accessible to Hispanic families. This process could involve several areas of study, such as: (a) larger scale effectiveness studies of parent-responsiveness interventions in Hispanic families of children with ASD; (b) an examination of “business as usual” service delivery for Hispanic families of children with ASD, such as public and private speech-language therapy, to determine effectiveness, cultural relevance, and possible areas for modification; (c) larger scale qualitative interviews with Hispanic caregivers of children with ASD, as well as with their service providers (e.g., speech-language pathologists), to determine early intervention experiences and perspectives; and (d) treatment comparison

studies, to determine the relative value of certain types of interventions (e.g., parent-responsiveness interventions, structured teaching interventions, and “business as usual” early interventions) for Hispanic families of children with ASD. The results of these investigations would create a framework for choosing and adapting early interventions to meet the needs of culturally and linguistically diverse families.

Beyond these primary research topics, several related topics could be examined in future research. One area for future study relates to moderators of child outcomes. In the second study, we speculated as to why only two out of three children made progress on social-communication targets, but more information was needed to accurately draw conclusions. Future intervention studies could examine potential moderators of child outcomes, such as parent fidelity to the intervention protocol, initial child developmental levels, the parents’ acculturation level, and parents’ level of concern about their child. Factors influencing parent fidelity to the intervention could also be examined.

ASD social support is another important area for future research. Parents in the third study emphasized that they needed social support, and were able to find this support in autism-specific communities, like the Autism Society of North Carolina, but had difficulty gaining support from other social networks, like extended families, friends, and their church communities. Future research could focus on establishing support systems for families of children with ASD, such as by educating and empowering communities to support these families, and/or by giving parents strategies they can use to share information about ASD to their social networks. Professionals are beginning to take steps toward this end, by providing ASD training programs to faith leaders in North Carolina (Department of Allied Health Sciences, 2015). Future research could build on these efforts for all families of children with ASD, including culturally and linguistically diverse families.

The third study also raised the question of how parent-responsiveness interventions impact children’s display of affection and feelings of empathy. As noted above, parents in the second and third study reported that their child showed more enjoyment and emotional-connection in parent-child interactions after ART. These studies only measured changes in child social-communication, not changes in child affect or empathy. Future research could examine ways to track these child qualities over time, to determine if parent-responsiveness interventions not only help to improve social-communication, but also influence children’s shared emotions and ability to identify with another person. This area of research also raises the question of how best to measure affect and responsivity, as noted above. In terms of responsivity, the first study indicated that behavioral coding systems may provide a more sensitive measure of changes in parent responsiveness; thus, future investigation of this question in larger samples

could help confirm or extend these findings. The dissertation failed to reliably measure “affect” in parents, so future studies could explore the benefits of continuing to measure this trait using rating systems, such as the Maternal Behavior Rating System (MBRS; Mahoney, 1999) or with another form of behavioral coding.

Another related area of future research is the development of bilingualism in children with ASD. In the third study, one family raised concerns that their child with ASD would be confused learning two languages, a belief shared by other families and professionals, despite emerging research to the contrary (Bird et al., 2012; Hambly & Fombonne, 2012; Petersen et al., 2012; Valicenti-McDermott et al., 2013; Yu, 2013). Research about bilingual development in ASD is still in its early stages. Families and professionals would benefit from additional research about (a) what milestones of bilingual development to expect, when compared to monolingual peers with ASD; and (b) strategies for promoting strong bilingual language development in children with ASD. Another issue to consider is “theory of mind” in monolingual versus bilingual children with ASD. When speaking two languages, children need to code-switch between one language and the next, depending on the language of their conversational partner; however, children with ASD have difficulties taking on another person’s perspective, which has implications for knowing which language they should use. It would be interesting to discover if theory of mind development differs between monolingual and bilingual children with ASD, based on code-switching opportunities, and/or if children with ASD would benefit from explicit teaching of this skill.

Conclusion

In conclusion, these studies were complementary in several ways: the ART intervention was shown to be valuable across each study, even though participants came from different cultural and linguistic backgrounds; the concept of “affect” seemed connected to “responsivity” on many levels; and, collectively, the studies create stepping stones for future research. Each study contributed unique and valuable findings to the field: reasons for choosing a coding system or rating system when measuring parent responsiveness; the success of ART among Hispanic toddlers and preschoolers with autism; and the importance of family-centered principles for creating an acceptable and feasible intervention approach. Researchers and clinicians are encouraged to use these results for future work with parents of children with autism, particularly those experiencing treatment disparities, so that, through continued research, “convivencia” [coexistence] can be possible for all families.

APPENDIX: POST-ART SEMI-STRUCTURED INTERVIEW QUESTIONS (ENGLISH VERSION)

ART therapy goals

1. Let's begin by discussing your experience with the ART therapy goals (i.e., the social-communication goals that were addressed in therapy, like social play). Tell me about the goals your child was working on in ART.
 - a. *Probe:* Do you feel that these goals were important for your child (i.e., were they skills that you wanted your child to achieve)?
 - i. *Prompt:* What makes those skills seem important/unimportant to you?
 - ii. *Prompt:* Give me an example of how these goals were important for child.
 - b. *Probe:* Do you feel that your child improved these skills during the ART therapy?
 - i. *Prompt:* What makes you feel that way?
 - c. *Probe:* In general, what are your hopes for your child (i.e., hopes for what your child will achieve in the future)?
 - i. *Prompt:* How do the ART therapy goals for your child fit in with these hopes, if at all?
2. [If not addressed in answer above] Are there other skills that you would have preferred to work on during the ART program?
 - a. *Probe* [If yes]: Give me some examples of skills you would have preferred to address in therapy.
 - i. *Prompt:* Tell me about what makes those skills important to you.
3. For this project, the goals focused on the Spanish language, rather than English. What's your opinion on encouraging your child to socialize and communicate in Spanish, rather than English?
 - a. *Probe* [If not addressed above]: Do you feel it's important to focus on your child's native language?
 - i. *Prompt:* What makes Spanish-language goals seem important/unimportant to you?
4. Anything to add about your child's goals in the ART program?

ART therapy

5. Now, let's talk about the actual therapy. Tell me about your experience with the ART therapy sessions.
 - a. *Probe:* Aspects about the therapy that you valued/found useful?
 - i. *Prompt:* Give an example of how the therapy seemed valuable/useful to you.
 - b. *Probe:* Aspects about the therapy that you didn't value/didn't think were useful?
 - i. *Prompt:* Give an example of how the therapy was not valuable/useful to you.
6. What is your opinion about the ART strategies (i.e., the strategies you and the therapist used to help your child with his/her social-communication skills)?

- a. *Probe:* In general, how frequently did you use the strategies between sessions (e.g., time per week that you practiced the strategies?)

[Ask about each strategy that was addressed with that particular family using the probes below]

- b. *Probe:* Did the strategy feel “natural” (i.e., did it fit in with your parenting style and your family life)?
 - i. *Prompt:* How so/how not?
 - ii. *Prompt:* [If it didn’t feel natural]: Did the strategy become natural with practice?
 - c. *Probe:* Between sessions, how frequently did you use this strategy with your child?
 - i. *Prompt:* How easy or difficult was it to use the strategy between sessions?
 - ii. *Prompt:* Barriers to using the strategy?
 - d. *Probe:* How well did the strategy seem to help your child with his/her social-communication skills?
 - i. *Prompt:* Give me an example.
 - e. *Probe:* Will you continue to use this strategy, now that your child has finished the ART program?
 - i. *Prompt:* Explain your reasoning.
 - f. *Probe:* What about other family members—did they use this strategy with your child (e.g., siblings, cousins, grandparents, etc.)? Or would they, if they had the opportunity?
 - i. *Prompt* [in general]: Tell me more about that.
 - ii. *Prompt* [if yes, they used the strategy]: Tell me how that went.
 - iii. *Prompt* [if no, they did/would not use the strategy]: What kept/would keep them from using the strategy?
7. Let’s talk about the structure of the ART program. You and the therapist met two times per week for about an hour. The therapist taught you strategies to help your child, and then you tried the strategies with your child. This all happened in the context of play and daily routines. Between sessions, you used the strategies at home with your child. What did you think about this structure?
- a. *Probe:* What seemed to work well/not work well about this structure?
 - i. *Prompt:* The time involved?
 - ii. *Prompt:* The context of the therapy? (e.g., at home, during daily routines and play)
 - iii. *Prompt:* Interactions/relationship with the therapist? Comfort level with the therapist?
 - iv. *Prompt:* The ways that the therapist taught you the information? For example:
 - Parent education handouts & session notes

- Practicing strategies & providing feedback to your use of strategies
 - Use of Spanish language (spoken language and the written translations)
- v. *Prompt:* You and your family's role in therapy?
- b. *Probe:* Tell me more about the role you and your family played during therapy.
- i. *Prompt:* Did you like the role you and your family played during therapy? How so/how not?
 - ii. *Prompt:* Has the ART program changed how you interact with your child in any way? How so/how not?
 - iii. *Prompt:* Do you perceive your role in your child's therapy any differently than before the ART program? How so/how not?
8. How does the ART therapy compare with other therapies your child has received/is receiving?
- a. *Probe:* [Ask about the therapies that the family has reported receiving]
- i. *Prompt:* Traditional therapies, like speech-language therapy?
 - ii. *Prompt:* Non-traditional treatments, like a *curandero* (folk healer)?
- b. *Probe:* Which therapies do you prefer (of the therapies your child has received)? [Ask about the therapies the family has reported receiving]
- i. *Prompt:* Play-based therapies vs. more structured therapies?
 - ii. *Prompt:* Therapies where you had an active role vs. a passive role?
 - ii. *Prompt:* What makes you prefer those therapies over the others?
9. Anything to add about your experience with the ART therapy?

Recommendations

10. Finally, we'd like to know your recommendations for using the ART program with Hispanic families. What are aspects of the ART program that you would keep the same and/or change, if it were to be used again with Hispanic families?
- a. *Probe:* The ART therapy goals? (i.e., aspects that should be kept the same and/or changed?)
- i. *Prompt:* How the goals are determined
 - ii. *Prompt:* The goals that are addressed
- b. *Probe:* Strategies that are used to help the child's social-communication? (i.e., strategies that should be kept the same and/or changed?)
- i. *Prompt:* [Ask the family about the strategies that they used in therapy]
 - ii. *Prompt:* Suggestions for adapting these strategies to fit your culture?
 - iii. *Prompt:* Suggestions for other strategies to help children with social-communication?

- c. *Probe*: The structure of the program? (i.e., aspects that should be kept the same and/or changed?)
- i. *Prompt*: The time frame?
 - ii. *Prompt*: The context of the therapy? (e.g., locations/situations that would be ideal for therapy, such as at home during play or other family routines)
 - iii. *Prompt*: The ways that the therapist teaches the information? For example:
 - Parent education handouts & session notes
 - Practicing strategies & providing feedback to parent use of strategies
 - Use of Spanish language (spoken language and the written translations)
 - iv. *Prompt*: The parents' role in the program? The role of other family members (e.g., siblings, cousins, grandparents)?
 - v. *Prompt*: Interactions/relationship with the therapist? Qualities that you value in this relationship?

Closing

Thank you so much for your participation. Is there anything else you would like to add?

Note. The interviews occurred in Spanish, but the English translation of the interview guide is provided here.

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