

FINDING 25 HOURS: A SINGLE-SUBJECT STUDY OF ENGAGEMENT FOR FAMILIES  
OF CHILDREN WITH AUTISM

A thesis presented to the faculty of the Graduate School of  
Western Carolina University in partial fulfillment of the  
requirements for the degree of  
Master of Science, Communication Sciences and Disorders

By

Sarah Noel Yucha

Director: Dr. Billy T. Ogletree  
Professor of Communication Sciences and Disorders; Department Head  
Communication Sciences and Disorders Department

Committee Members: Dr. Kelly Kelley, Inclusive Education  
Dr. Georgia Hambrecht, Communication Sciences and Disorders

April 2019

## ACKNOWLEDGEMENTS

I would like to thank my committee members and director for their assistance and encouragement. Each particular person has added valuable and unique insights to this paper's creation and without whom this study would have not been possible. In addition, I am very appreciative of Meghan who gave of her valuable time to learn about active engagement and code videos for this thesis.

I also extend sincere thanks to the family that participated in this study. Their time and efforts in remaining faithful to this experience were valued greatly and appreciated. Lastly, I would like to thank my parents, Jim and Kim Yucha, who have shown unending love and support to me in all of my endeavors.

## TABLE OF CONTENTS

List of Tables .....	iv
List of Figures .....	v
Abstract .....	vi
Chapter One: Introduction and Literature Review.....	1
Active Engagement and Children with ASD .....	1
Communication Intervention with ASD .....	2
Active Engagement as a Key Feature of Effective Communication Intervention for Children with ASD.....	4
Challenges Specific to Intensive Interventions for Children with Autism.....	5
Changing Service Delivery .....	6
Communication Partner Instruction .....	9
Research Question.....	10
Chapter Two: Methods .....	12
Participants.....	12
Variables .....	13
Procedure .....	13
Design .....	13
Treatment .....	15
Data Collection and Analysis.....	20
Chapter Three: Results.....	22
Research Question .....	22
Interrater Reliability.....	22
Active Engagement.....	23
Routines .....	26
Maintaining a Regulated State .....	26
Communication Exchanges .....	26
Summary.....	27
Interview Questionnaire.....	27
Educational Provider Assessment.....	27
Chapter Four: Discussion.....	29
Purpose.....	29
The Three Trained Elements of Active Engagement.....	30
Routines .....	30
Behavior Regulation .....	31
Communication Exchanges .....	31
Qualitative Changes in Child Communication .....	32
Active Engagement.....	32
Limitations and Future Directions .....	34
Conclusions.....	35
References.....	37
Appendices.....	44
Appendix A: Educational Provider Assessment.....	46
Appendix B: Interview Questionnaire .....	46

LIST OF TABLES

Table 1. Sample Training Descriptions in CPI Steps for Routines.....16

## LIST OF FIGURES

Figure 1. Percentage of Baseline and Treatment Video Sessions Actively Engaged .....	24
Figure 2. Percentage of Baseline and Treatment Video Sessions Where Active Engagement Characteristics Occurred.....	25
Figure 3. Degree of Agreement with Active Engagement Statements Before and After Intervention.....	28

## ABSTRACT

### FINDING 25 HOURS: A SINGLE-SUBJECT STUDY OF ENGAGEMENT FOR FAMILIES OF CHILDREN WITH AUTISM

Sarah Noel Yucha, M.S.

Western Carolina University (April 2019)

Director: Dr. Billy T. Ogletree

This study examined the use of a parent training effort to increase parental engagement with children diagnosed with Autism Spectrum Disorder (ASD). ASD is a neurodevelopmental condition defined by persistent deficits in communication and social interaction accompanied by restrictive and repetitive patterns of behavior, interests, or activities (National Research Council, 2001). Without effective treatment, the social, emotional and behavioral deficits associated with ASD can limit individuals' abilities to achieve complete and rewarding community inclusion. The National Research Council recommends 25 hours per week of engagement as appropriate evidence based practice for education and intervention of children with ASD. Challenges related to treatment efforts of this intensity include finances, time, available education, and trained clinical personnel. Based on Sparapani, Morgan, Reinhardt, Schatschneider, and Wetherby's (2015) research on active engagement, this study defined active engagement as, a time where a child is in a well-regulated state centered in a routine, so that the child and stakeholder can participate in shared communicative exchanges characterized by: initiation and response of verbal bids, and flexibility of shifts in attention and activity which can lead to spontaneous communication, production of generative language, and participation in eye gaze shifts. Many of

these aspects of active engagement have been identified in research literature pertaining to core learning challenges for children diagnosed with ASD including: Emotional Regulation, Productivity, Independence, Responding, Eye Gaze, Directed Communication, Generative Language, Flexible Behavior, and Flexible Attention. This study proposed the use of parent training designed to increase parent-child engagement. The training effort, delivered via the Communication Partner Instruction model created by Kent-Walsh and McNaughton (2005), described, trained, and measured active engagement and assisted with the identification of engagement opportunities throughout the "typical" lives of parents and children focusing on the three key components of active engagement: routines, well-regulate state, and response to and initiation of communication bids. The intent of training was to increase engaged activities between parents and children to a level closer to the optimal prescribed levels (25 hours). Findings supported the use of CPI with two participants in promoting two of three dependent variables related to active engagement (i.e., the creation or routines and communication bids). Findings are discussed with respect to increasing active engagement episodes in the lives of children with ASD.

## CHAPTER ONE: INTRODUCTION AND LITERATURE REVIEW

### **Active Engagement and Children with ASD**

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition characterized by deficits in social communication, as well as restricted or repetitive behaviors and interests (American Psychiatric Association, 2013). In the United States, ASD is diagnosed in 1 in 59 children (Center for Disease Control, 2018). The historically high prevalence of ASD is drawing considerable attention, particularly from those charged with this population's care. The most recent revision of the Diagnostic and Statistical Manual (American Psychiatric Association, 2013) delineates two broad areas of deficit in ASD. First, individuals on the autism spectrum have difficulties with social communication and interaction that may result in deficits in: social-emotional reciprocity (e.g., turn-taking, initiation of social interaction), nonverbal communication behaviors (e.g., maintaining appropriate eye contact, using appropriate gesture/facial expressions), and everyday relationships (e.g., making friends, adjusting behavior to social context). Without communicative and social competence, persons with ASD face daily disadvantages ranging from the inability to express simple preferences to difficulty with establishing and maintaining relationships. This population also exhibits restricted and repetitive patterns of behavior often evidenced as either stereotypic motor movements, insistence on sameness, highly restricted and specialized interests, or hyper/hypo-responsiveness to sensory input/experiences. Again, these behaviors place persons with autism at significant risk for underachievement, limited employment, and difficulty with community integration. The social and behavioral challenges described above can range in severity and require limited to substantial degrees of support throughout life.

The provision of supports across varied environments makes care for individuals with ASD complex and resource intensive. In 2005, “the average annual medical costs for Medicaid-enrolled children with ASD were \$10,709 per child...[and] intensive behavioral intervention for children with ASD costs \$40,000-\$60,00 per year” (Center for Disease Control and Prevention, 2018, para. 4). In addition, other stressors (e.g., family, educational, employment) associated with children on the autism spectrum are both exhausting and frustrating (Steijn et al., 2013). As prevalence figures rise and families and social/educational systems grapple with financial and other costs associated with this condition, interventionists must turn to effective treatments capable of mitigating outcomes of ASD. Differing treatment methods have been used to help children potentially avoid some of the long-term negative impacts of ASD (Smith & Eikeseth, 2010; Schriebmann et al., 2015). A frequent focus of these interventions is communication.

### **Communication Intervention in ASD**

Intervention typically involves environmental adjustments (i.e., physical or interactive) that change recipients’ performance or behavior (National Autism Center, 2015). Communication intervention approaches can be viewed in terms of Comprehensive Treatment Models (CTMs) or more focused individual practices. Communication intervention for individuals with ASD occurs along a continuum that encompasses traditional behavioral, developmental social-pragmatic and contemporary behavioral approaches (Prelock, 2006; Prizant & Wetherby, 2001; Wong et al., 2013). Of course, communication intervention can be conducted by a speech-language pathologist (SLP) as well as other stakeholders including parents and family members. The speech-language pathologist’s role in intervention can be both consultative or direct (Ogletree, 2016).

In a recent review, Ogletree, Rose, and Hambrecht (2019) describe several evidence-based and practitioner-friendly communication interventions along the continuum of supports utilized in intervention. These authors review structured, semi-structured, and limited structure intervention options frequently used by those seeking to promote communicative growth in individuals with ASD (Ogletree et al., 2019). Most, if not all of these interventions, have significant empirical support as reported by the National Professional Development Center in Autism Spectrum Disorders (Wong et al., 2014 - revised 2015, 2016).

Clearly, evidence-based communicative interventions for individuals with ASD are available today. At least two factors seem critical to their effective use. The first is treatment intensity or dosage. The National Research Council, backed by systematic reviews, recommends that children receive 25 hours each week of “active engagement” in, “systematically planned, developmentally appropriate educational activities” (Wetherby et al., 2014; National Research Council, 2001). Twenty-five hours of engaged intervention, then, has become the treatment intensity “gold standard” for best practice intervention for children with ASD. The concept of active engagement is addressed more fully in the section that follows.

Aside from intensity, treatment timing is critical with “the earlier the better” being the general rule of thumb. Positive treatment outcomes are more likely when interventions for children with ASD are initiated in the first two years of life (Committee on Educational Interventions for Children with Autism, 2001). Outcomes can include greater opportunities for speech and reduced costs associated with care throughout life (Wannenburg & Niekerk, 2018). Early intervention (EI) efforts are optimized when treatments occur in natural environments and stakeholders are actively involved. Ideal stakeholder intervention involvement often requires coaching by EI providers (Adams & Tapia, 2013).

In sum, effective intensive early interventions appear to be closely tied to growth across social, emotional, and behavioral domains for children with ASD. Progress across these domains is critical to skill acquisition and optimal life outcomes for individuals with ASD (Anderson et al., 2009). Furthermore, ideal early interventions for children with ASD occur in natural training environments and involve multiple stakeholders as trainers. Without early exposure to effective interventions, outcomes for individuals with ASD and their loved ones can be less promising and financial/other stressors can mount (Wetherby et al., 2014).

### **Active Engagement as a Key Feature of Effective Communication Intervention for Children with ASD**

From the review above, it is apparent that active engagement is a central element of effective early interventions for children with autism. Active engagement can be defined as time where a child is well-regulated, participating in a routine, and available for shared communication exchanges (Sparapani et al., 2015). Shared communicative exchanges are characterized by: 1) initiation and response to verbal bids; 2) flexibility of shifts in attention and activity (which can lead to spontaneous communication); 3) production of generative language; and 4) participation in eye gaze shifts (Sparapani et al., 2015). Child indicators of active engagement include: emotional regulation, productivity, independence, responding, eye gaze, directed communication, generative language, flexible behavior, and flexible attention (Sparapani et al., 2015).

To date, studies emphasizing active engagement have failed to define this concept in a manner that allows for its use and study across varied communication contexts (e.g., classrooms, home, community; Greenwood, 1996; Greenwood et al., 2002; Klem & Connell, 2004). Existing studies have occurred in classrooms rather than preferred naturalistic environments

(Leekman et al., 2011; Richler et al., 2010; Rotheram-Fuller et al. 2010; Turner, 1999). When seeking active engagement, classrooms provide a particular challenge to children with ASD as restricted and repetitive behaviors tend to occur at increased rates in these settings (Wetherby et al., 2014).

Research is needed to understand how to create and measure active engagement in early intervention efforts research. Efforts should focus on the generation of a measurable definition useful across all environmental contexts.

### **Challenges Specific to Intensive Communication Interventions for Children with Autism**

Substantial challenges face providers committed to early communication interventions targeting active engagement. Variables complicating service delivery include, but are not limited to costs and access to trained therapists. Given charges for skilled therapy (Newhouse, 2013) and potential additional childcare costs for children not in treatment, the financial obligations associated with intensive early communication intervention can be prohibitive. Furthermore, some areas of the United States may not have access to SLPs (Hartley, 2004) and some SLPs lack current training in evidence-based treatment practices for this population (Antezana et al., 2017). These factors alone are significant barriers to intervention, but possibly the largest impediment is time.

Twenty-five hours of active engagement (the NRC, 2001 recommended total) can feel daunting for parents/caregivers of a child diagnosed with ASD. Simply put, families struggle to find the hours in a day to structure engaged episodes or to take children to skilled providers. Aside from time constraints for the family, SLPs face significant caseload and workload pressures that reduce available time for intensive treatments. Statistics suggest that today's therapist has little time for intensive interventions. SLPs working in preschool settings may have

30 or more children on their caseloads (Janota, 2018). National statistics specific to caseloads in school settings (e.g., day, preschools, elementary, secondary and combinations) reveal averages loads of 31 to 76 students (Janota, 2018). Beyond caseload constraints, SLP workload issues equally impact treatment availability. ASHA identifies workload as an unrecognized time consuming variable in most SLP's schedules (American Speech-Language-Hearing Association, 2019). Simply put, some cases require significant preparation due to their inherent complexity. Too many "complex" cases on SLP caseloads can complicate the already full schedules of providers.

Given the need for early and intensive communication interventions for children on the autism spectrum and the time and other constraints face by families and SLPs, new intervention paradigms must be considered.

### **Changing Service Delivery**

While intensive early intervention treatments exist for children with autism, few embrace all of the critical features of effective interventions described thus far (e.g., a focus on active engagement, application in natural environments, and use of coaching or stakeholder training). Furthermore, the challenges to implementing intensive treatments (described above) plague families and providers regardless of the intervention option chosen. Intensive communication treatments such as: 1) Applied Behavior Analysis; 2) Naturalistic Behavioral Interventions; and 3) The Hanen Method that are potentially useful in early intervention are considered below.

One widely used intensive intervention for children with ASD is Applied Behavior Analysis (ABA), commonly referred to as the Lovaas Method (Smith & Eikeseth, 2010). This approach emphasizes, "early intervention for preschoolers with autism provided in family homes with active parental participation" (Smith & Eikeseth, 2010, p.375). ABA utilizes Discrete Trial

Training (DTT) to train subunits of larger tasks, ultimately shaping new, desired behaviors (Ünlü, Vuran & Diken, 2018). Benefits to ABA in an early intervention setting include documented skill gains across many developmental domains (Smith & Eikeseth, 2010). ABA specialists propose 40 hours a week of skilled intervention for children with ASD, arguing that learning must occur all day, every day at rates similar to typically developing peers.

A 40-hour training week presents a substantial time burden on families. Interestingly, there are little available data supporting the 40-hour training target (Smith & Eikeseth, 2010). Furthermore, ABA therapy has been criticized for its structured and rigid framework (Trump et al., 2018). Specifically, ABA's prescriptive nature has provided little room for the individualization of therapy. For example, the strict adherence to this method's instructional guidelines can place restrictions on children's autonomy and may stifle individual choice during the shaping of behaviors.

ABA's prescriptive intervention may make it more likely to be used in non-inclusive educational settings. According to the Individuals with Disabilities Act (2004), children with disabilities must be educated in the least restrictive environment possible. Although ABA can contribute to effective therapeutic outcomes (i.e., the reduction of effective maladaptive behaviors; Kearney, 2015), it can contribute to a restrictive instructional environment for children with ASD.

Schriebmann et al. (2015) has modified the more traditional ABA design into the Naturalistic Developmental Behavioral Interventions (NDBIs). NDBIs evolved from the idea that affective exchange between the child and the therapist facilitate learning. Along this line of thought, supporters of NDBIs suggested deficits in affective sharing and social motivation observed in children with ASD necessitate the application of strategies to promote affective

engagement (Schriebmann et al., 2015). In NDBIs, therapeutic targets are pursued in a child's typical daily environment instead of taught discretely or in isolation. NDBIs seeks to, "provide an infrastructure to support efficient and effective learning involving functional skills used in everyday life, particularly social-communication learning via interactive, meaningful exchanges with others" (Schriebmann et al., 2015, p.2416). With NDBI, parents/caregivers become central providers of intervention, "through adult-child engagement activities that transform into motivating play routines or familiar daily routines" (Schriebmann et al., 2015, p.2416). NDBI's integration of core ABA learning principles combined with a naturalistic environment and parent/caregiver centered implementation appear to make these interventions meet more of the characteristics of effective intensive early communication treatments than traditional ABA.

The Hanen Method provides a final example of an early and potentially intensive communication treatment option for children in the autism spectrum. The Hanen Method, or "It Takes Two to Talk," emphasizes the use of ongoing nondirective instructional strategies such as modeling and expansion within daily routines (The Hanen Center, 2016). These strategies are provided to parents of children with disabilities who participate in training with certified instructors.

The Hanen Method has some empirical support for its use (Carter, 2011) and shares commonalities with NDBIs in that it utilizes parents and natural routines. Hanen differs from NDBIs as it promotes the use of less directive instructional techniques and places a clear focus on active engagement within parent-child interactions.

The Hanen Method and NDBIs provide interventionists with treatment options than can be delivered intensively with very young children on the autism spectrum. Both focus on parents and natural routines, and the Hanen Method appears to value elements of active engagement

defined earlier in this review. The Hanen method also includes a parent training component making it consistent with recommended guidelines for effective early interventions. It is certainly possible that a greater parent training focus on active engagement, as it is defined in this review and recommended by the NRC (2001), may make Hanen and other similar programs even more effective.

### **Communication Partner Instruction**

Simply utilizing parents/caregivers in the service delivery model follows American Academy of Pediatrics recommendation (Adams & Tapia, 2013) but does not go far enough. A general commitment to parent involvement may not include the coaching needed to help support parents/caregivers in the delivery of intervention. Coaching, or training, will be necessary if parents and other stakeholders are to become highly skilled and competent communication partners capable of scaffolding and supporting the communication needs young children with ASD. One partner training program is the Communication Partner Instruction (CPI) (Kent-Walsh & McNaughton, 2005). CPI varies from the other three intervention methods in that it provides a more structured framework for scaffolding the levels of supports given by the interventionist, and it follows a uniform and specific routine for how to teach any skill.

The Communication Partner Instruction model was created by Kent-Walsh and McNaughton (2005) and provides an appropriate coaching/training framework for parents/caregivers of children with ASD. The CPI training process is based upon the strategy instruction model of Ellis et al. (1991), and provides evidence-based guidelines to the partners of children or adults with communication impairments (Kent-Walsh & McNaughton, 2005). CPI, described more completely below, has been used effectively with parents of children with ASD to promote interaction styles that facilitate communication and Augmentative and Alternative

Communication use (Kent-Walsh & McNaughton, 2005). In contrast to some programs that utilize one-time or at best limited training with parents/caregivers, CPI offers a sequence of training steps designed to facilitate adult learning.

Traditional CPI follows an eight-step strategic model designed to teach partners new skills. Training steps include: 1) Pretest and commitment to instructional program, 2) Strategy Description, 3) Strategy Demonstration, 4) Verbal practice of strategy steps, 5) Controlled practice and feedback, 6) Advanced practice and feedback, and 7) Posttest and commitment to long-term strategy use (Kent-Walsh & McNaughton, 2005). Written and verbal commitment to training is important as committed trainers are, “more successful in their efforts to acquire these skills and in implementing complex cognitive strategies” (Kent-Walsh & McNaughton, 2005, p. 199) CPI has been shown to be an effective means to train many skills associated with communication intervention (Douglas, 2012) and would appear to be a reasonable training vehicle to assist parents with learning and applying the principles of active engagement critical to early, intensive, and effective intervention with young children on the autism spectrum.

As eluded to earlier in this review, the idea of training parents as early intervention agents is not novel. The Hanen Model boast an over 35 year history (The Hanen Center, 2016) and NDBIs have been used since the 1980s (Carr & Kologinsky, 1983; McGee, Krantz, Mason, & McClannahan, 1983). CPI, however, has not been applied to parent training efforts in early intervention.

### **Research Question**

This study proposes to apply CPI as a training format to train two parents of children with ASD specifics about active engagement in an attempt to increase engaged episodes throughout everyday interactions. If successful, CPI may be a useful tool to promote 25-hours of active

engagement weekly, the recommended intervention total for children with ASD. The study offers a clearly operationalized definition of ASD and employs CPI to train parents to increase engaged episodes. The research question posed is:

Can Communication Partner Instruction be used within a partner training sequence to train parents of a young child with ASD to increase episodes of active engagement with their child?

## CHAPTER TWO: METHODS

### **Participants**

Two sets of parents ( $n = 4$ ) of two children (one preschool aged the other elementary school-aged) with ASD originally agreed to participate in this study. All parents signed informed consent documents from Western Carolina University's (WCU) Institutional Review Board describing the study and parent/child participation. Stating that due to the time demands of filming the videos for this research project, the parents of the school-aged child withdrew their participation before data collection.

The preschool aged child of the participating couple was a four-year old Caucasian girl. She was diagnosed with ASD at age two. She was enrolled in a developmental day preschool for eight hours a day, five days a week. There were 15 children and six teachers in her preschool class. Developmental services received by this child at the time of the study included: behavioral therapy—30-minutes once per week, occupational therapy—30-minutes once every other week, speech therapy twice a week every week (school setting), and speech therapy once a week for 45-minutes (Western Carolina University's Speech and Hearing Clinic). This would total about two hours and forty-five minutes if she received all her scheduled therapy sessions in one week. The focus of behavioral therapy was increased attention to task while occupational therapy efforts addressed fine motor moments and integrating sensory experiences. Speech therapy effort was delivered through play and Prelinguistic Milieu Teaching (Yoder & Warren, 2002). Speech therapy targets included vocabulary and phrasal expansion. At the initiation of this study, this child was best described as an emergent verbal communicator capable of spontaneous and echoed speech ranging from single words to some three-word combinations. Her comprehension was noted to be somewhat dependent upon context and assisted by visual supports.

The biological parents, hereafter referred to as “the participants,” were married and resided in Webster, North Carolina. The father is a college graduate while the mother holds her Ph.D. in Criminology. Both participants worked, one in food sales/services and the other as a university professor. The participants had never taken formal parenting classes except for parent-centered services their child received through the Children’s Developmental Services Agency (CDSA) when their child was two and three years of age.

### **Variables**

The independent variable for this study was the CPI treatment sequences created to train the critical elements of active engagement to participants. These sequences are described in the narrative, tables, and appendices that follow. The dependent variables were three critical elements of active engagement including: 1) the creation of routines; 2) the promotion of well-regulated states; and 3) the generation of communication exchanges or bids. These variables are defined more fully in the following narrative.

### **Procedure**

#### **Design**

A multiple baseline across behaviors design was implemented to train participants to increase active engagement episodes using Communication Partner Instruction (CPI; Kent-Walsh & McNaughton, 2005). A pretreatment phase included an interview session and five, 30-minute baseline sessions where play-sessions were video recorded. Pretreatment also included the distribution of a questionnaire (described below) to the lead preschool teacher where the participants’ child received developmental services. The treatment phase included three treatment sessions where three distinct behaviors deemed critical to active engagement were trained over a seven week period. Treatment sessions (described in a subsequent section)

consisted of 60 minute instructional periods offered via video conferencing with the investigator and both participants present for all sessions. Each session was led by the investigator who used the CPI training sequence to deliver three independent areas of content specific to active engagement. After each training session, three additional 30-minute play videos (baseline for non-trained variables and treatment for trained variables) were recorded for later analysis. Finally, one treatment follow-up session was offered where all aspects of active engagement were reviewed and discussed as a whole. Participants were questioned specific to knowledge of active engagement were administered prior to, during, and after treatment.

After signing consent and during the pretreatment phase described above, the participants were provided with one prompt and one question about their knowledge and application of active engagement which included: 1) “Tell me what you understand about active engagement”; and 2) “How would you describe your current effort to be actively engaged with your child?” After completion of two training sessions and during the follow-up session described above, two additional questions were posed to participants: 1) “How has the training sequence changed your ongoing daily routines?” 2) “What are your thoughts or impressions of our efforts to increase actively engaged times with your child?” These questions helped assess the study for aspects of social validity.

Although the child was not a subject of this study, the examiner sought to record teacher perceptions of active engagement (Sparapani et al., 2013) by surveying the lead educational provider pre- and post-treatment. Survey statements were rated on a 5-point Likert scale (higher ratings representing stronger agreement) specific to the child’s participation in structured routines, attentional shifts and communication bids, and ability to maintain a well-regulated state throughout their day (see Appendix A). Space was provided below each 5-point rating for

explanation of response chosen. The assessment was completed by the child's educational provider prior to and after treatment.

### **Treatment**

Pre-treatment baseline videos consisted of five, 30-minute videos of typical play between the participants and their child. No explanation or training was provided to participants about active engagement prior to these sessions. One or both parents were present during baseline recordings. The five, 30-minute baseline videos were recorded over a span of 12 days.

After the pre-treatment phase, active engagement was defined and trained through four training sessions based on Sparapani et al. (2013)'s definition. According to Sparapani et al., active engagement occurs as children engage in routines, maintain well-regulates states, and shared communication exchanges with others. Definitions used for these variables are provided in narrative that follows. Training variables were introduced during a four-training session sequence with one variable taught each of the first three sessions and all variables reviewed during the final session. The first three training sessions employed CPI. The final training phase consisted of a review where all variables of active engagement were discussed within the context of everyday activities.

The first three training sessions employed phases of CPI training including: 1) pre-test and commitment to instructional program; 2) strategy description; 3) strategy demonstration; 4) verbal practice of strategy steps, 5) controlled practice and feedback, 6) advanced practice and feedback; 7) post-test and commitment to long-term strategy use; and 8) generalization of targeted strategy use (Kent-Walsh & McNaughton, 2005). A sample training sequence with descriptions of a training session is provided in Table 1. Narratives that describe training sessions for each of the three active engagement characteristics follow.

Table 1

*Sample Training Descriptions in CPI Steps for Routines*

CPI Stage	Training Description
1 Pretest and commitment to instructional program	Instructor explains purpose of the study, participants verbally commit to learning targeted strategies and instructor asks participants a pretest question about routines.
2 Strategy description	Instructor describes what a routine is and the methods involved in creating communicative routines with participants' child
3 Strategy demonstration	Instructor verbally models how they would implement and utilize preexisting routines for moments of active engagement and why the instructor would choose them.
4 Verbal practice of strategy steps	Participants practice naming the four components that make up a routine.
5 Controlled practice and feedback	Participants name the four components of a routine when given a scenario. Participants also practice identifying and describing these components in a controlled environment with fading instructor support.
6 Advanced practice and feedback	Participants explain how they would create and utilize routines given scenarios in a variety of settings with fading instructor support and feedback.
7 Posttest and commitment to long-term strategy use	Instructor gives feedback and asks questions based on participants' performance throughout given scenarios to check for mastery of targeted strategy. Instructor helps participants think through already occurring routines in their week and how they can shape them to become more communicative.
8 Generalization of targeted strategy use	Participants practice implementing routines into one of their pre-identified times over the following week and plan how they can make that functional for long-term use.

Training sessions took place via the online video conferencing service (Skype) and lasted between 45 minutes to one hour. A shared PowerPoint was viewed during the sessions while participants listened to trainer and were encouraged to ask questions and make comments. Both participants were present for all training sessions.

The first training session occurred three weeks after baseline videos were collected. Following CPI steps 1-2, at the beginning of this session, the trainer reviewed the purpose of this study in an effort to encourage participant “buy in.” The session began with the participants responding to the initial qualitative survey questions/requests including: 1) “Tell me what you understand about active engagement”; and 2) “How would you describe your current effort to be actively engaged with your child?”

Session one trained creating routines. Sparapani et al.’s (2015) definition was used which states that routines include: 1) the presence of a logical sequence; 2) a clear beginning; 3) recognizable roles for participants; and 4) specific participants responses that lead to the completion of an activity (Sparapani et al., 2015). Examples of routines were identified for participants by giving examples of food preparation (e.g., making a sandwich, packing a lunch), play activities (e.g., dolls, bubbles, blocks, cars) and daily events (e.g., putting on clothes, brushing teeth). Participants were coached through a series of scenarios while given scaffolding supports as outlined in CPI training steps 3-7. The session closed with participants being asked to: 1) identify and review routines discussed during the session; and 2) imagine other daily routines not included in training where session strategies could be employed. Participants responded orally to post-test questions to assess understanding of routines. Participants were instructed to record three, 30-minute play sessions applying information learned about routines. These video sessions were recorded over a span of 12 days.

The second training session occurred three days after session one videos were collected. The session focused on emotional regulation. Following CPI steps 1-2, emotional regulation was defined as, “the duration of time the student spends in a well-regulated state” (Sparapani et al., 2015, p.794). Well-regulated states occur as children match the demands of their physical and

social environments (Sparapani et al., 2015). Walker's 2017 study on emotional regulation intervention for preschool children with ASD provided the primary content for this CPI training sequence. Walker's study emphasized adults helping children become aware of emotions and seek out support when feeling upset and presented calming strategies. Walker taught calming strategies including tactile stimulation (e.g. stress ball, light squeeze/pressure); audiovisual stimulation (e.g. visually stimulating toy, adult singing, calming music); cooling down (e.g. paper/electronic fan, cool wash cloth, drink of water); deep breathing (e.g. blowing on pinwheel, taking deep breaths); comfort (e.g. blanket/comfort item, adult hug/pat on the back, calming scent); and relaxing (e.g. closing eyes, resting/relaxing body).

For the present study, the CPI training model coached participants the specifics of Walker's 2017 guided model for promoting regulated states. The session included how to: 1) offer help; 2) use an adaptive emotional regulation strategies; 3) verbally guide the child through calming down; and 4) praise the child after calming. CPI steps 3-7 were followed through a series of scenarios where participants were coached using scaffolding supports. CPI training helped participants identify how to help their child be more emotionally regulated during routines and what to do if they become dysregulated. Participants also responded to mid-point qualitative interview questionnaire of their experiences. Questions included: 1) "How has the training sequence changed your ongoing daily routines?"; and 2) "What are your thoughts or impressions of our efforts to increase actively engaged times with your child?"

As session two ended, participants were asked to identify their child's inflexible or dysregulated times and to think about how training content could assist with flexibility. This was followed by a discussion of adaptive emotional regulation strategies and environmental modifications that could be incorporated into current participant-child routines.

Participants responded orally to post-test questions to assess understanding of behavior regulation. Participants were instructed to record three additional 30-minute play sessions focusing on what they had learned specific to emotional regulation. These videos were recorded over a span of 23 days. Illness and a semester break protracted this timeframe.

The third training session occurred the day after the final session-two video was recorded and collected. The subject of this session was sharing communication exchanges. Following CPI steps 1-2, pre-test questions were considered and a communication exchange was defined as an episode where both joint engagement and communication bids occurred (i.e., either were initiated or responded to; Killmeyer & Kaczmarek, 2017). Joint engagement was further defined as either supported joint engagement (SJE; where parent and child share attention to an object but child does not consistently acknowledge presence of parent happening first), or coordinated joint engagement (CJE; where parent/child share attention to an object/event and at the same time initiate and respond to bids for shared attention in a turn-taking manner; Killmeyer & Kaczmarek, 2017). The concept of initiating and responding to communication bids was based upon Ingersoll and Dvortscsak's 2010 study of interactive techniques. Techniques included: 1) arranging oneself and the environment to encourage interactions; 2) animating communication actions and imitating child actions; 3) modeling simple language and expanding by one word; 4) balancing turns (e.g., counting to share, modeling and expanding play); and 5) creating opportunities by restricting access to objects/events in a fun/playful way or something unexpected.

Participants were coached through a series of scenarios where they incorporated interactive techniques designed to promote communication bids while given scaffolding supports from the researcher as outlined in CPI training steps 3-7. Participants responded orally to post-

test questions to assess understanding of communication exchanges. The session ended with discussions about how skills learned and focused attention could create opportunities for communication exchanges. Three, 30-minute sessions were recorded over a span of 16 days.

The post-treatment phase occurred one week after last treatment/baseline videos were recorded and collected. The fourth session was a follow-up that promoted active engagement across typical life activities. This was completed by reviewing the three critical variables of active engagement, i.e., engaging in routines, promoting well-regulate state, and participating in communication exchanges (Sparapani et al., 2013), and discussing their implementation across an array of daily activities. Due to time constraints of this study, follow-up videos were not recorded.

At the time of the final treatment session, teacher perceptions of active engagement were surveyed a second time (i.e., the lead teacher of the participants' child). In addition, participants responded to final qualitative interview prompts/questions specific to active engagement.

### **Data Collection and Analysis**

All videos (baseline and treatment) were: 1) recorded by the participants with a cellphone camera; 2) downloaded by the participants to mobile storage; 3) provided to the researcher; and 4) stored securely by either the researcher or her faculty sponsor. Each video was coded in its entirety three times by the researcher for the presence of dependent variables, i.e., routines, mutual emotional state regulation, and the presence of communication bids. Coding was assisted by a video timeline that allowed for the notation of the exact time and duration of each variable's presence throughout the videos. The timelines of the three dependent variables were combined to determine times where all variables were present in a play episode. These occurrences were designated as actively engaged episodes. In addition, to determining the presence of active

engagement, the occurrence of each dependent variable was considered independently over baseline and treatment video sessions allowing for data analysis specific to the treatment as the sequence unfolded.

In addition to the analysis described above, participants' pre-treatment, treatment, and post-treatment responses to questions specific to active engagement were transcribed verbatim and utilized to support quantitative findings. Finally, pre- and post-survey questions provided to the lead teacher of the child with autism were transcribed verbatim and utilized to support quantitative findings.

## CHAPTER THREE: RESULTS

### **Research Question**

This study proposed to apply Communication Partner Instruction (CPI) as a training format to train two parents of children with ASD specifics about active engagement in an attempt to increase engaged episodes throughout everyday interactions. A three-session treatment sequence was designed and taught the three characteristics of active engagement: routine creation and maintenance, behavior regulation, and increased communication bids or exchanges. Each treatment session implemented all phases of CPI training in pursuit of one of the active engagement elements mentioned above. One set of participating parents declined to participate after learning of the time demands involved with the study. What follows is the presentation of findings specific to the following research question. Can Communication Partner Instruction be used within a partner training sequence to train parents of a young child with ASD to increase episodes of active engagement with their child?

### **Interrater Reliability**

Ten percent of all videos were rated by a second trained coder for interrater reliability on moments of active engagement. The second rater was a second year graduate student in Communication Sciences and Disorders at Western Carolina University trained by the researcher specific to the dependent variables. Training included receiving and reviewing copies of the three training session's instructional materials (i.e., materials presented to the participants in this study) and the coding procedures. After the second coder reviewed training content and coding processes, the researcher and second rater jointly coded a video of mother-child play not related to the present study. Following procedures to be used for the study's videos, the second rater coded the practice video specific to the presence or absence of the three active engagement

variables every 15 seconds. Discrepancies in coding were discussed between the researcher and second trained coder to increase agreement in ratings. Following practice coding, the second rater coded 10% of all study videos.

Inter-rater reliability (or the kappa statistic) was calculated by counting the total number of ratings in agreement between the two coders and the total number of ratings possible (total number of 15 second blocks in this study is 120). Then the total number of ratings possible was divided by the total number of ratings in agreement to receive a fraction. This fraction is multiplied by 100 to convert to a percentage. When ten percent of videos were coded those percentages were averaged together to get an interrater reliability of 81% for the presence or absence of active engagement.

### **Active Engagement**

For the purposes of this study active engagement was noted to occur within parent-child interactions when routines were ongoing, child behaviors were regulated, and communication exchanges occurred. Data specific to active engagement in baseline and treatment videos are presented in Figure 1.

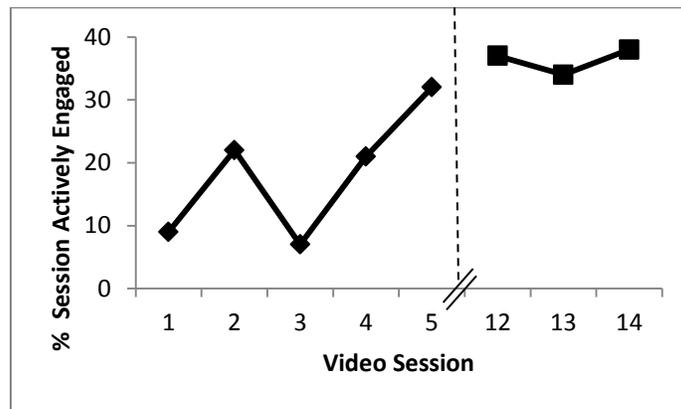
This study employed a multiple baseline design across three characteristics considered critical to active engagement. Figure 1 presents data about overall active engagement from the five baseline session and three post-treatment sessions. Data are plotted across sessions and by percentages of total behaviors coded. Data for all 15 second codings were collapsed to create one data point representing the percentage of coded times intervals where all three elements of active engagement were present. For example, the first baseline data point in Figure 1 reveals that 9% of 15 second intervals coded in this session were recorded as being moments of active engagement (i.e. all three characteristics: routines, well-regulates state, and communication

exchanges or bods were marked in that 15 second interval). Percentages were used rather than frequencies of actual behaviors to accommodate subtle differences of lengths of recorded sessions.

It should be noted that the baseline in Figure 1 is not stable. Although the first four data points reflect variance of 15 or so percentage points, the final baseline entry reflects a more substantial upward trend.

Figure 1

*Percentage of Baseline and Last Three Treatment Video Sessions Actively Engaged*



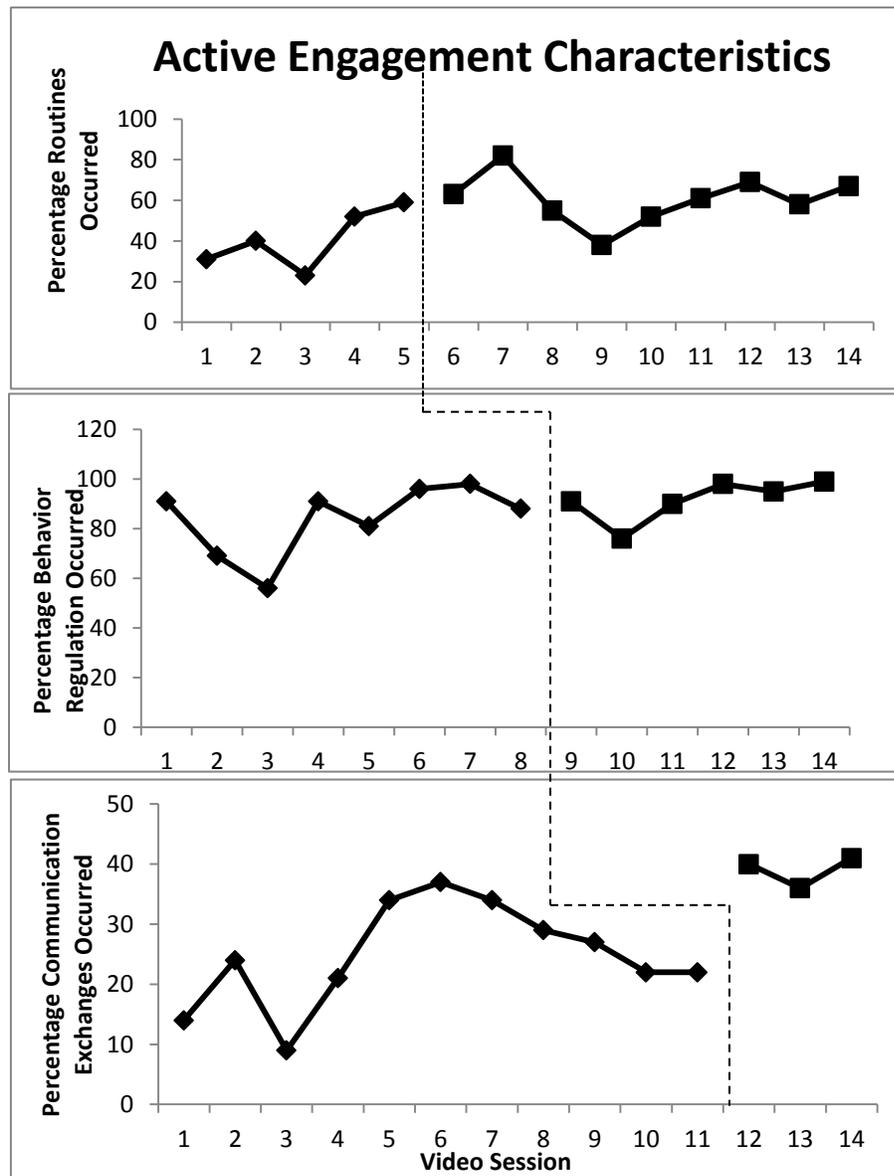
Note: The dotted line represents the change from baseline to post-intervention data points. Data points before the dotted line fall in the baseline phase; data points after the dotted line fall in the last three sessions of the intervention phase.

Data for individual behaviors of active engagement characteristics: 1) routines; 2) behavior regulation; and 3) communication exchanges were tracked to see how these characteristics changed throughout the sessions and how these individual characteristics

potentially influenced one another (see Figure 2). Data are plotted in 15 second intervals across sessions and by percentages of total behaviors coded for that individual characteristic.

Figure 2

*Percentage of Baseline and Treatment Video Sessions Where Active Engagement Characteristics Occurred*



Note: The dotted line denotes the change from baseline to post-intervention data points. Data points before the dotted line fall in the baseline phase; data points after the dotted line fall in the treatment phase.

### **Routines**

The initial training session occurred after five baseline (recorded video) sessions and focused on routines. Participants learned about the elements of effective routines and how to introduce and manage routines in their child's life. Data from Figure 2 reveal an initial increase in percentages of routine occurrence in videos directly post-treatment (sessions 6 and 7). Five of nine post treatment data points exceeded the highest baseline data point (59%).

### **Maintaining a Regulated State**

The second training session occurred 15 days after the first training session and focused on maintaining emotional regulation. Participants learned how to identify when their child was in emotionally regulated state, how emotional regulation relates to moments of active engagement, and what to do if their child became dysregulated. Data from Figure 2 reveal that this element of active engagement had the most stable baseline data points of the three active engagement elements trained. Figure 2 reveals that data points remained relatively stable throughout intervention process with only two treatment data points being either the same or higher than the highest baseline data point (98%).

### **Communication Exchanges**

The third training session occurred 24 days after the second training session and focused on communication exchanges. Participants learned how to help facilitate an increase in initiating and responding to child communication bids through a series of interactive techniques. Data

from Figure 2 show the most distinct difference of non-overlapping data points from baseline to treatment with two of the three treatment data points exceeding the highest baseline data point (37%). Baseline data were relatively unstable with a sharp increase from sessions 3-6 and a gradual decline from sessions 6-11 before increasing again when treatment occurred (see Figure 2).

### **Summary**

Each of the three characteristics considered critical to active engagement varied when treatment was introduced for that particular characteristic. For example, when treatment for routines occurred, behavior regulation and communication exchanges increased. Likewise, when treatment for behavior regulation occurred, routines and communication exchanges decreased. When treatment for communication exchanged occurred, behavior regulation and routines increased.

### **Interview Questionnaire**

Participant comments about intervention techniques and understanding of topics trained were collected through an interview questionnaire (see Appendix B). Participants' perceptions of the study were positive overall. Their responses to interview questionnaire reflected an interactive pattern change from initially being more passive to eventually becoming more active communication partners. This interview questionnaire provided an aspect of social validity to this study as it tracked the impact and importance of the intervention to the family at the beginning, mid-point, and end of the study (Kennedy, 1992).

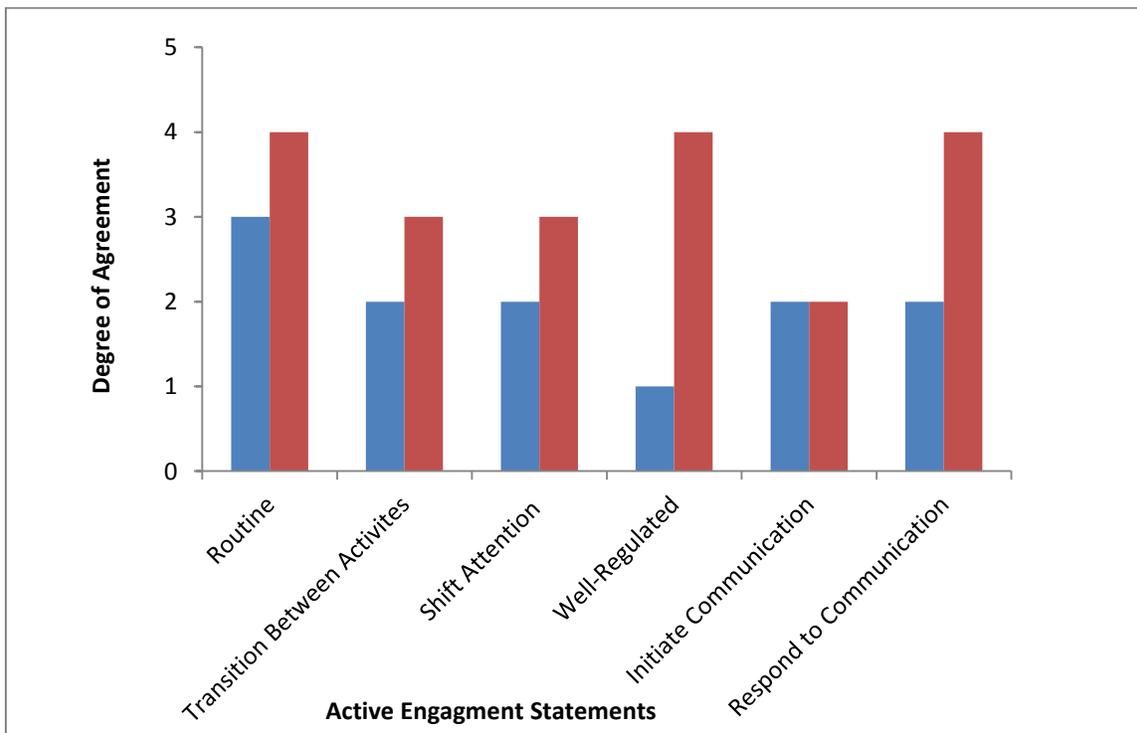
### **Educational Provider Assessment**

In regards to generalization across different settings, an educational provider assessment was completed by the child's teacher before and after the intervention. The format was a seven

question 5-point Likert Scale and assessed the three elements of active engagement trained in this study (see Appendix A). Figure 6 shows the teacher’s ranking of their perspectives on the child’s growth in the skills listed below. Of most importance is the 3-point increase specific to perceptions of the child’s ability to stay well-regulated throughout her school day, and the 2-point increase in response to communication bids. Perceptions of the child’s initiation of communication exchanges remained the same.

Figure 6

*Degree of Agreement with Active Engagement Statements Before and After Intervention*



Note: Columns on the left indicate educational provider’s degree of agreement (with 0 being strong disagree and 5 being strongly agree) before intervention and columns on the right indicate degree of agreement after intervention.

## CHAPTER FOUR: DISCUSSION

### **Purpose**

This study was instigated, in part, due to the call for 25 hours per week of active engagement for children diagnosed with Autism Spectrum Disorder (NRC, 2001). The suggestion of providing 25 hours of any weekly therapeutic activity to parents and other stakeholders of children with autism has been daunting. Simply put, traditional practitioner-driven therapies don't support 25 hours for any one child. The fact that one family initially selected for this study declined participation due to time commitments illustrates this point. Obviously, 25 hours of active engagement only seems possible if training is re-conceptualized.

This research sought to apply an evidence-based training methodology (the Communication Partner Instruction model) in the instruction of three active engagement elements to parents of one child with autism. The underlying assumption of this effort was that trained parents would provide the best opportunity for increasing systematic and ongoing active engagement episodes in a child's life and, therefore, more closely approximate 25 hours of active engagement. Of course, the efforts of parents can and will be augmented with engagement provided by individuals in the professional community who also serve the child.

This study questioned whether CPI could be used within a partner training sequence to train parents of a young child with autism to increase episodes of active engagement with their child. It used an established definition of active engagement to provide the basis for three training sessions organized using CPI. A multiple baseline across behaviors design was employed to collect data specific to the three target elements of active engagement. In addition, surveys/questionnaires were completed by the participating parents (the participants) before, during, and after treatment. Pre- and post-study surveys were also collected from the preschool

teacher of the participating child specific to changes in characteristics of her engagement. What follows is a discussion of findings.

### **The Three Trained Elements of Active Engagement**

#### **Routines**

The first training session targeted the introduction and maintenance of routines. Baseline data points indicated a less than desirable upward trend. This stated, two initial treatment data points and four of the final seven data entries revealed increases in routines over the highest baseline point (see Figure 2).

Overall, the percentage of data points indicating ongoing routine in baseline sessions ranged from 23% to 59% per session and data points indicating ongoing routines in treatment sessions ranged from 38% to 82% per session. This suggests a minor yet positive shift in routine occurrence post-treatment. This said, the upward trend of treatment data points is slight at best.

One could speculate that a single session training session was insufficient to train the notion of routines. That is, more time and even hand-on practice might have been useful (remember this training occurred via a distance framework). It is also interesting to note that the elevation of initial treatment data points after routine training coincide with elevated baseline data points related to regulated behavior and communication bids. This may suggest that understanding routines positively impacted the occurrence of these behaviors. Therefore, routines may share traits with well-regulated behavior and the presence of communication bids. In sum, it appears that only a small treatment effect was observed specific to CPI training and increasing routines.

## **Behavior Regulation**

The second training session targeted teaching behavior regulation strategies including: identifying when the participants' child was in emotionally regulated state, knowing how emotional regulation relates to ability to have moments of active engagement, and knowing what to do if their child become dysregulated. Behavior regulation had the most stable data points (see Figure 2) with only two treatment data points being either the same or higher than the highest baseline data point (96%). Overall, the percentage of data points indicating ongoing behavior regulation of the child in baseline sessions ranged from 56% to 98% per session and data points indicating ongoing behavior regulation of the child in treatment sessions ranged from 76% to 99% per session. This suggests a minimal yet positive shift in overall behavior regulation occurrence post-treatment.

It could be suggested that due to the nature of the study requiring videos to be recorded, that the participants chose to film sessions when their child was in a well-regulated state, especially given the need to record a 30-minutes session. In the educational provider assessment completed by the child's teacher, the ability to maintain a well-regulated state throughout her school day was her most improved skill moving from "strongly disagree" to "agree" ratings (see Figure 3). Finally, the routine nature of the home setting may have made emotional regulation less of an issue at home than at school.

## **Communication Exchanges**

The third training session targeted teaching participants to facilitate increased communication exchanges or bids. Figure 2 shows that baseline data was relatively unstable with a sharp increase from sessions 3-6 and a gradual decline from sessions 6-11 before increasing again when treatment occurred. This could be due to the inclusion of activities more conducive

to communication (i.e., offering more communicative opportunities) such as: reading books, playing pretend with a dollhouse, and making a pizza.

Overall, the percentage of data points indicating communication exchanged between participants and child in baseline sessions ranged from 9% to 37% per session and data points indicating communication exchanged between participants and child in treatment sessions ranged from 36% to 41% per session, showing that with intervention, these parents promoted increased communication exchanges.

### **Qualitative Changes in Child Communication**

Although not measured directly in this study, perceived changes in overall quality of the child's communication between baseline and intervention sessions 12-14 are of interest. For example, during the final three treatment sessions communicative exchanges with direct eye contact appeared to increase as did responsiveness to the communication bids of parents. Less echolalia was also observed. These observations are in agreement with the educational provider assessment results (see Figure 3).

Of course, without an experimental focus of the child's behaviors, it is difficult to claim any direct treatment effect specific to the observations above. That said, the suggestion that child behaviors might have changed due to intervention provides a direction for future study.

### **Active Engagement**

To answer the research question for this study, all 15-second data points for the three elements of active engagement were collapsed into a percentage of the session the child was actively engaged (see Figure 1). Figure 1 includes data points from the five baseline sessions and the final three treatment video sessions. Although an erratic baseline pattern is once again present, all treatment data points exceed the highest baseline data measurement.

This provides at least limited support for the idea that active engagement, as defined by the concomitant presence of routine, regulated behavior, and communication bids was impacted by the training sequence. This said, still less than 40% of data points at any time reflected the presence of all of trained elements. Conversely, over 60% of data points failed to achieve “active engaged” status as defined by this study.

Looking at baseline sessions, four of the five data points indicate less than 22% presence of all three characteristics occurring to indicate a moment of active engagement. This is in contrast to the final three intervention data points that all had moments of active engagement at 34% or higher. This suggests that intervention played some role in increasing moments of active engagement.

It is possible that longer or increased training sessions may have contributed to larger, more pronounced changes in active engagement. Some participant comments support increased training such as the identification of the helpfulness of review sessions with remembering prior information.

In-person training may have also been helpful as well as occasional assistance with child care. For example, it can be speculated that in-person training could have increased modeling and demonstration opportunities. Furthermore, in-person training with child care when needed would have reduced occasional periods where child-related competition for attention occurred. It could be argued, however, that the methods used in this study were more realistic as many parents of children with ASD do not have the ability to directly observe a trained professional working with their child, but receive training through handouts or verbal explanations.

Finally, participant responses to survey questions throughout the study provide interesting insight into changes in perceptions related to active engagement. Participants’

perceptions of the study were positive overall. Their understanding of active engagement from the beginning to the end of the study is reflected in two quotes. For example, initially the parents described active engagement as, “getting down on her level to focus on an activity and use those moments to repeat words.” At the end of the study, active engagement was described as, “finding activities that can incorporate: routines, turn-taking, sharing, joint-attention, encourage verbalizations, and build off skills she already has.” Obviously, understanding evolved from a more passive focus on “repeating words” to a more active effort to “encourage verbalizations.”

### **Limitations and Future Directions**

Several limitations impact the ability to draw broader conclusions from the present study. First, only two parents and one child participated. Clearly, definitive conclusions about the efficacy of CPI trainings specific to active engagement await larger studies. Second, participant exposure to prior therapeutic efforts may have altered outcomes. For example, the parents had observed therapeutic services in their home and in clinical settings since their child’s diagnosis. These and other prior experiences could have impacted the way participants approached training and video sessions. Third, the time between each of the three training sessions was not uniform due to school holidays, technological issues, and illness. This could have impacted how training elements coalesced, impacting the effectiveness of the training sequence. In future studies it would be of best practice to have a uniform timeline for when video sessions were to be completed by and for when training sessions occurred. Fourth, the three dependent variables suggested to comprise active engagement may not, in fact, be independent of each other. Finally, there is the possibility that other external influences may have impacted the performance of the parents such as reading articles about active engagement, observing a trained profession working

with their child, or discussing ideas for moments of active engagement with professionals not participating in the study.

In regards to study set-up and data collection methods, two limitations were present. First, inter-rater reliability was calculated for 10% of all video recordings for moments of active engagement (when all three elements were present) as opposed to being calculated separately for each individual element. The second limitation was that due to time constraints of the study no follow-up videos were recorded to assess carry-over of trained active engagement elements.

Further studies specific to increasing active engagement should consider larger partner training efforts and trainings that vary by length and physical presence of the trainer. In addition, active engagement has not been defined well until recently (Sparapani et al., 2015) meaning that the individual characteristics of active engagement are still being studied. This study sought to assist in gathering support for individual active engagement characteristics, but further studies are needed to see how independent these characteristics are from one another. Future studies should include a greater number of measures for active engagement in socially valid ways outside of the data collection sessions. Finally, the lead teacher report is important for examining how these skills cross-over into the classroom, but as the teacher was not trained to observe these behaviors an increased effort in this area is needed.

### **Conclusions**

In the introduction of this thesis, a need was stated for interventionists to consider alternative treatment paradigms as they pursued 25 hours of weekly active engagement for children on the autism spectrum. The argument was made that service delivery based upon discrete and infrequent “treatments” would never reach this goal and that more intensive traditional therapies would exhaust resources and dominate “life experiences” for stakeholders

and children alike. If, however, those closest to the child with autism (e.g., their parents) could learn to promote active engagement within typical daily experiences, the target of 25 hours per week may be within reach. That is, if daily interactions could be shaped to be routine oriented, promote emotional regularity, and support communication bids, maybe the task of “finding 25 hours” could be managed.

The present study illustrated support for the use of CPI training sequences to increase active engagement episodes between two parents and their child with ASD. Qualitative findings also support treatment with positive perceptions of the training sequence and improved perceptions of active engagement outside of the treatment context. What does this tell us with respect to the research question posted? Could CPI be a vehicle to teach key elements of active engagement? For at least two of the variables trained in this single case the answer is a qualified “yes.” This is supported by the quantitative data and the qualitative comments/observations of the participating parents and their child’s teacher. More holistically, one might then ask, could CPI be one alternative means of increasing active engagement? Again, although this study has its limitations, the qualified answer with respect to this one case is yes.

Continued research is needed if speech-language pathologists and others are to approach the “gold standard” of 25 hours a week of active engagement with children with autism. This study provides both some encouraging initial findings and ideas for improved efforts in this regard. This line of research warrants continued research as all children deserve the opportunity to achieve their communicative potential.

## REFERENCES

- Adams, R. C., & Tapia, C. (2013). Early intervention, IDEA Part C services, and the medical home: Collaboration for best practice and best outcomes. *Pediatrics*, *132*(4), 1073-1088. doi:10.1542/peds.2013-2305
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- American Speech-Language-Hearing Association. (2019). *Caseload and workload*. Retrieved April 15, 2019, from [https://www.asha.org/PRPSpecificTopic.aspx?folderid=8589934681&ion=Key\\_Issues#Factors\\_Impacting\\_Workload](https://www.asha.org/PRPSpecificTopic.aspx?folderid=8589934681&ion=Key_Issues#Factors_Impacting_Workload)
- Anderson, D. K., Oti, R. S., Lord, C., & Welch, K. (2009). Patterns of growth in adaptive social abilities among children with autism spectrum disorders. *Journal of Abnormal Child Psychology*, *37*(7), 1019-1034. doi:10.1007/s10802-009-9326-0
- Antezana, L., Scarpa, A., Valdespino, A., Albright, J., & Richey, J. A. (2017). Rural Trends in Diagnosis and Services for Autism Spectrum Disorder. *Frontiers in Psychology*, *8*, 590. doi:10.3389/fpsyg.2017.0059
- Baio J., Wiggins L., Christensen D.L., Maenner, M., Daniels, J., Warren, Z....Dowling, N. (2018). Prevalence of autism spectrum disorder among children aged 8 years — autism and developmental disabilities monitoring network, 11 Sites, United States, 2014. *MMWR Surveillance Summary* 2018;67(No. SS-6):1–23.

- Carr, E. G., & Kologinsky, E. (1983). Acquisition of sign language by autistic children. II: Spontaneity and generalization effects. *Journal of Applied Behavior Analysis, 16*(3), 297-314. doi:10.1901/jaba.1983.16-297
- Carter, A., Messinger, D., Stone, W., Celimli, S., Nahmias, A., & Yoder, P. (2011). A randomized controlled trial of Hanen's 'More Than Words' in toddlers with early autism symptoms. *Journal of Child Psychology and Psychiatry, 52*(7), 741-752. doi:10.1111/j.1469-7610.2011.02395.x
- Center for Disease Control and Prevention. (2018). *Data & statistics on Autism Spectrum Disorder*. Retrieved March 4, 2019, from <https://www.cdc.gov/ncbddd/autism/data.html>
- Committee on Educational Interventions for Children with Autism. (2001, June 13). Early intervention is key to educating children with autism. Retrieved April 12, 2019, from <http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=10017>
- Ellis, E., Deshler, D., Lentz, B., Schumaker, J., & Clark, F. (1991). An instructional model for teaching learning strategies. *Focus on Exceptional Children, 23*(6), 1-24.
- Greenwood, C.R. (1996). The case for performance-based instruction models. *School Psychology Quarterly, 11*, 283-296. doi: 10.1037/h0088935.
- Greenwood, C.R., Horton, B. T., & Utley, C.A. (2002). Academic engagement: Current perspectives on research and practice. *School Psychology Review, 31*, 328-349. Retrieved from <http://www.naspweb.org/publications/index.html>
- Hartley, D. (2004). Rural health disparities, population health, and rural culture. *American Journal of Public Health, 94*, 1675-1978. doi:10.2105/AJPH.94.10.1675

Individuals with Disabilities Education Act, 20 U.S.C. § 300.114 (2004).

Janota, J. (2018). *2018 schools survey: SLP caseload and workload characteristics*

[Report]. Rockville, MD: American Speech-Language-Hearing Association.

Kearney, A. J. (2015). *Understanding applied behavior analysis, An introduction to ABA for parents, teachers, and other professionals* (2nd ed.). Philadelphia, PA: Jessica Kingsley Publishers.

Kennedy, C. H. (1992). Trends in the Measurement of Social Validity. *The Behavior Analyst*, *15*(2), 147-156. doi:10.1007/bf03392597

Kent-Walsh, J., & McNaughton, D. (2005). Communication Partner Instruction in AAC: Present practice and future directions. *Augmentative and Alternative Communication*, *21*(3), 195-204. doi:10.1080/07434610400006646

Klem, A. M., & Connell, J. P. (2004). Relationship matter: Linking teacher support to student engagement and achievement. *Journal of School Health*, *74*, 262-273.  
  
doi: 10.1111/j.1746-1561.2004.tb08283.x.

Leekman, S. R., Prior, M. R., & Uljarevic, M. (2011). Restricted and repetitive behaviors in autism spectrum disorder: A review of research in the last decade. *Psychological Bulletin*, *137*, 562-593 doi:10.1037/a0023341.

Mcgee, G. G., Krantz, P. J., Mason, D., & Mcclannahan, L. E. (1983). A modified incidental-teaching procedure for autistic youth: Acquisition and generalization of receptive object labels. *Journal of Applied Behavior Analysis*, *16*(3), 329-338. doi:10.1901/jaba.1983.16-329

National Autism Center. (2015). *Evidence-based practice and autism in the schools* (2nd ed.).  
Randolph, MA.

National Research Council. (2001). Early intervention is key to educating children with autism.  
Retrieved February 08, 2019, from  
<http://www8.nationalacademies.org/onpinews/newsitem.aspx?RecordID=10017>

National Research Council. (2001). *Educating children with autism*. Washington, DC:  
Committee on Educational Interventions for Children with Autism.

Newhouse, M. (2013). In private practice: Am I charging too much? Not enough? *The ASHA  
Leader*, 18(3), 27-28. Retrieved from  
<https://leader.pubs.asha.org/doi/10.1044/leader.IPP.18032013.27>.

Ogletree B.T. Rose A., Hambrecht G. (2019). Evidence based methods for teaching school-age  
children and youth with autism spectrum disorder and complex communication needs. In  
*Interventions for Individuals with Autism Spectrum Disorder and Complex  
Communication Needs*. (pp.193-224) Baltimore, MD: Paul H. Brookes Publishing.

Ogletree, B. T. (2015). Meeting complex communication needs associated with genetic  
syndromes: A call to interprofessional education and practice. *Perspectives on  
Augmentative and Alternative Communication*, 24(3), 67. doi:10.1044/aac24.3.67

Prelock, P. A. (2006). *Communication assessment and intervention in autism spectrum  
disorder*. Austin, TX: Pro-Ed.

Prizant, B.M, & Wetherby, A.M. (2001), *Communication Scales Development profile:  
Infant/toddler*. Baltimore, MD; Brookes Publishing.

- Richler, J., Huerta, M., Bishop, S. L., & Lord, C. (2010). Developmental trajectories of restricted and repetitive behaviors and interests in children with autism spectrum disorder. *Development and Psychopathology*, 22, 55-69. doi:10.1017/s0954579409990265.
- Rotheram-Fuller, E., Kasari, C., Chamberlain, B., & Locke, J. (2010). Social involvement of children with autism spectrum disorders in elementary school classrooms. *Journal of Child Psychology and Psychiatry*, 51, 1228-1234. doi:10.1111/j.1469-7610.2010.02222-y.
- Schreibman, L., Dawson, G., Stahmer, A. C., Landa, R., Rogers, S. J., Mcgee, G. G.... Halladay, A. (2015). Naturalistic developmental behavioral interventions: Empirically validated treatments for autism spectrum disorder. *Journal of Autism and Developmental Disorders*, 45(8), 2411-2428. doi:10.1007/s10803-015-2407-8
- Smith, T., & Eikeseth, S. (2011). O. Ivar Lovaas: Pioneer of applied behavior analysis and intervention for children with autism. *Journal of Autism and Developmental Disorders*, 41, 375-378. doi:10.1007/s10803-010-1162-0
- Sparapani, N., Morgan, L., Reinhardt, V. P., Schatschneider, C., & Wetherby, A. M. (2015). Evaluation of classroom active engagement in elementary students with autism spectrum disorder. *Autism Developmental Disorder*, 46, 782-796. doi:10.1007/s10803-015-2615-2
- Steijn, D. J., Oerlemans, A. M., Aken, M. A., Buitelaar, J. K., & Rommelse, N. N. (2013). The reciprocal relationship of ASD, ADHD, depressive symptoms and stress in parents of children with ASD and/or ADHD. *Journal of Autism and Developmental Disorders*, 44(5), 1064-1076. doi:10.1007/s10803-013-1958-9.

- The Hanen Center. (2016). It takes two to talk® — The Hanen Program® for parents of children with language delays. Retrieved from <http://www.hanen.org/Programs/For-Parents/It-Takes-Two-to-Talk.aspx>
- Trump, C., Pennington, R., Travers, J., Ringdahl, J., Whiteside, E., & Ayres, K. (2018). Applied Behavior Analysis in special education: Misconceptions and guidelines for use. *Teaching Exceptional Children, 50*(6), 381-393. doi:10.1177/0040059918775020
- Turner, M. (1999). Annotation: Repetitive behavior in autism: A review of psychological research. *Journal of Child Psychiatry, 40*, 839-849. doi:10.1111/1469-7610.00502.
- Ünlü, E., Vuran, S., & Diken, I. H. (2018). Effectiveness of discrete trial training program for parents of children with autism spectrum disorder. *International Journal of Progressive Education, 14*(3), 12-31. doi:10.29329/ijpe.2018.146.2
- U. S. Department of Labor. (2018, June 28). American time use survey – 2017 results. Retrieved from <https://www.bls.gov/news.release/atus.nr0.htm>
- Walker, B. L. (2017). *Evaluating the effectiveness of combined emotion recognition and emotion regulation interventon for preschool children with autism spectrum disorder* (Unpublished doctoral dissertation). Miami University.
- Wannenburg, N., & Van Niekerk, R. (2018). Early diagnosis and intervention for autism spectrum disorder in Africa: Insights from a case study. *African Health Science, 137-146*. doi:<https://dx.doi.org/10.4314/ahs.v18i1.18>

Wetherby, A. M., Guthrie, W., Woods, J., Schatschneider, C., Holland, R. D., Morgan, L., & Lord, C. (2014). Parent-implemented social intervention for toddlers with autism: An RCT. *Pediatrics*, 1084-1093. doi:10.1542/peds.2014-0757

Wong, C., Odom, S., Hume, K., Cox, A., Fetting, A., Kucharczyk, S....Schultz, T. (2013). *Evidence-based practice for children, youth, and young adults with autism spectrum disorder* (Rep.). Chapel Hill, NC: The University of North Carolina

Yoder, P. J., & Warren, S. F. (2002). Effects of prelinguistic milieu teaching and parent responsivity education on dyads involving children with intellectual disabilities. *Journal of Speech, Language, and Hearing Research*, 45(6), 1158-1174. doi:10.1044/1092-4388(2002/094)

APPENDIX A: EDUCATIONAL PROVIDER ASSESSMENT

Date: \_\_\_\_\_

Educational Provider Assessment

Your student’s family is participating in a research study through Western Carolina University. Please respond to the following statements based on your student’s current performance in the selected areas. You will rate the student based on the following 1-5 scale and then will be asked to make a comment on why you chose that numerical rating. Responses should be brief but informative.

- 1-Strongly Disagree
- 2- Disagree
- 3- Neither Agree not Disagree
- 4- Agree
- 5- Strongly Agree

1. The student is able to participate in a structured routine.

**1                      2                      3                      4                      5**

Reason for Chosen Rating:

2. The student is flexible in transitioning between activities.

**1                      2                      3                      4                      5**

Reason for Chosen Rating:

3. The student is flexible in shifting their attention between activities and speakers.

**1                      2                      3                      4                      5**

Reason for Chosen Rating:

4. The student is well-regulated (has an emotional state that matches the demands of their physical and social environment) the majority of the day.

**1                      2                      3                      4                      5**

Reason for Chosen Rating:

5. The student is able to effectively initiate communication with another person.

**1                      2                      3                      4                      5**

Reason for Chosen Rating:

6. The student is able to effectively respond to someone initiating a communication interaction with them.

**1                      2                      3                      4                      5**

Reason for Chosen Rating:

Thank you for your participation in this survey. Please email your completed survey and direct any comments/questions to:

