EFFECTS OF PARENT TRAINING ON THE ACTIVE ENGAGEMENT OF CHILDREN WITH AUTISM SPECTRUM DISORDER

By

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To all who encouraged me to ask “why,” then challenged me to seek my own answers

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LIST OF ABBREVIATIONS

ASD	Autism Spectrum Disorder
MTW	More Than Words- The Hanen Program for Parents of Children with Autism Spectrum Disorder
CARD	Center for Autism and Related Disabilities
SCERTS	Social-Communication, Emotional Regulation, and Transactional Supports

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The purpose of this study was to examine the effectiveness of an 11-week intervention targeting parents of children with autism. Specifically, this single-subject design study attempted to define the construct of active engagement, and determine whether facilitation of parents' roles as primary interaction partners would result in increased child engagement for three children at different stages of communication.

Through an intensive schedule of small group sessions and individualized in-home coaching and feedback visits, parents received training in naturalistic strategies to draw out communication and social interaction from their children. Research data consisting of 20-minute samples of parent-child interactions was collected prior to the onset of the program, following each small group session, and in the 3 months following the program's conclusion. Samples were analyzed and time stamped to indicate engagement or lack thereof. Outcomes were then measured as the percentage of the interaction during which the child was engaged.

Variability of change across communication stages was observed, with the greatest improvement in magnitude and stability of active engagement seen in the child at the earliest stage.

This research suggests that parents are able to successfully learn and apply strategies to facilitate child engagement. It also suggests the need for more descriptive measures of engagement for children with more advanced communication skills. As the importance of fostering engagement early on in the development of children with ASD is well established in the literature (National Research Council, 2001), clinicians should be aware of the potential that parent training has as a tool within their scope of practice.

CHAPTER 1
INTRODUCTION

What is Autism Spectrum Disorder?

Autism spectrum disorder (ASD) is a group of neurobiological developmental disabilities consisting of autism, Asperger's syndrome, and pervasive developmental disorder-not otherwise specified (PDD-NOS). Autism spectrum disorders, along with Rett's syndrome and childhood disintegrative disorder, fall under the umbrella term of pervasive developmental disorders (American Psychiatric Association, 2000). As the precise etiology and mechanistic implications of autism are still largely unknown, its identification relies on commonalities in developmental and behavioral characteristics.

The defining features of autism spectrum disorders are differences in communication, social interaction, and restricted and/or repetitive interests or behaviors. Each of these three core areas is a spectrum in itself, meaning that manifestations characteristic of the impairment may vary in extent and manner of presentation within an individual and across the population. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR), a diagnosis of autism requires that a person evidence abnormalities in each area, with onset prior to 3 years of age, and failure to meet criteria for Rett's syndrome or childhood disintegrative disorder (American Psychiatric Association, 2000).

Communicative differences may present as a delay or failure to develop verbal language or other communication modalities, difficulty or inability to initiate and sustain conversation, echolalic or idiosyncratic use of language, and limited pretend play. Early red flags for deficits in communication include little or absent joint attention, or shifting gaze between objects and persons or pointing to share interest or enjoyment and seek reciprocity, and limited cooing, babbling, and other speech-language milestones (Wetherby et al., 2004).

Social interaction may be characterized by limited use and understanding of rules and behaviors that govern social interactions, such as nonverbal cues (eye contact, facial expressions, gestures, and postures). Persons with autism spectrum disorders may struggle with aspects of relationships that require theory of mind skills and reciprocity, including sharing enjoyment or interests, understanding others' emotions, and social pragmatics (see White, Keonig, & Scahill, 2007 for review).

Restrictive and repetitive behaviors can range from intense, unusual interests to preoccupation with routines, fixation on smaller parts of a whole object, or stereotypic motor movements (Rapin, 1991).

Many of the behaviors displayed by people with autism can be classified as sensory-seeking behaviors. Although sensory needs are not a core trait of ASD, hyper or hypo-sensitivities in visual, olfactory, auditory, taste, tactile, kinesthetic, or vestibular systems are common. Arm-flapping, walking on toes, looking at things from unusual angles, and clapping hands over ears are just a few examples of behaviors that may be attempts to raise or lower one's internal arousal level to a state consistent with social and environmental demands (Prizant, Wetherby, Rubin, Laurent, & Rydell, 2006). Prizant et al. (2006) contend that this may also be reflected in a strong preference for routines, which provide external structure and predictability, lessening the contribution of environmental input to the sensory system and simplifying internal emotional regulation.

Janzen (2003) argues that learning style differences are inherent in autism. People with autism are generally considered Gestalt learners, but not Gestalt thinkers (Janzen, 2003). Gestalt learners absorb experiences in large chunks, without necessarily filtering details based on relevance or meaning. Gestalt thinkers automatically analyze, sequence, and attribute meaning to

information from experiences, then store it with other relevant knowledge to form a more complete idea. Although it is unclear whether these differences in experiential processing and acquisition of knowledge are causally linked to other deficits, the effects are synergistic, compounding the difficulty with more implicit or advanced social and communication skills. For example, impairments in attending to people or the parts of stimuli deemed “important” may manifest in the development of speech or another language form without the knowledge needed to use it effectively in a two-way communicative exchange. Overly literal interpretations may result from difficulty understanding nonverbal and suprasegmental cues. Thus, gestalt processing and an atypical pattern of early social development limit the drawing of meaning and generalization beyond a specific frame of reference to more complex skills such as perspective-taking, adapting responses, and social judgment (Janzen, 2003). This en masse absorption also relates to the sensory system and the concept of sensory overload. Whereas a typically developing person may ignore the feel of the carpet, the hum of the air conditioner, or the smell of the trash can, a person with autism may attend to each of these details as much if not more than the task at hand. The overwhelming environmental sensory input coupled with a heightened internal state may lead to extreme disregulation (Liss, Saulnier, Fein, & Kinsbourne, 2006).

Addressing areas of impairment with respect to these differences in learning styles is central to developing an effective treatment plan. Goals should also have a basis in chronological and age-appropriate developmental skills as well as functional skills needed for independence (Janzen, 2003).

Active Engagement

Active engagement is an essential component in effective intervention for children with autism. The National Research Council (NRC, 2001) recommends a minimum of 25 hours a week of intervention where the person with ASD is engaged in intensive, goal-directed activities.

The NRC (2001) defined engagement as “sustained attention to an activity or person (p.160).” A comprehensive definition of engagement, however, must acknowledge that time present in an activity is not necessarily equivalent to time engaged (Ruble & Robson, 2007). It is here that some researchers consider the shared meaning and intent of an interaction between communicative partners. Known as congruent engagement, this concept is consistent with developmental approaches, with respect given to both the internal state of the child and the external environment (Ruble & Robson, 2007). Preliminary data from Ruble and Robson (2007) identified congruent engagement as a particular weakness for children with autism compared to children with Down Syndrome, and suggested its inclusion as a target for all children with disabilities.

Definitions of engagement vary widely across the literature. The problem exists in the lack of a definition used with any consistency that is observable, measurable, and replicable for use in research experiments. The operationalization of active engagement would allow more accurate interpretation of treatment outcomes relative to the amount of time the participant was available to benefit from intervention and total time of intervention. Similarly, the advantages and disadvantages of different methods could be compared based on those variables. Other related research could explore the interaction of motivational factors and active engagement.

Active engagement is crucial for people with ASD because it allows a child to shift attention and apply social knowledge, communicate with a partner, and learn from experiences (Prizant et al., 2006), all of which are critical areas of impairment. According to the SCERTS Model (Prizant et al., 2006), active engagement occurs when one’s emotional state is in tune with environmental demands. This is the only time at which a child is available for learning. As the fluent social communicator, the adult must put the appropriate “transactional supports” in place

to foster engagement. In their ongoing study of the Early Social Interaction Project, Wetherby and Lord (as cited in Lord, 2008), state that the adult should structure the environment, shift attention to the child's focus, balance conversational turns, use multiple modalities to bolster comprehension, and continuously reassess the child's emotional regulation and adjust expectations. The child, in turn, must be in a balanced state of arousal, participating in a goal-oriented activity, and demonstrating reciprocal social interaction in order for engagement to be achieved.

Others have taken a more discrete behavioral approach to engagement. In their study using video self-modeling to increase engagement in children with autism, Bellini, Akullian, and Hopf (2007) termed participation in an activity involving reciprocal exchanges with a peer as "social engagement." Examples of social engagement included reciprocal play, joint play, and turn-taking. Parallel play, negative interactions, and avoidance behaviors were counted as non-engagement. They further operationalized their definition with a series of qualifying social initiations and responses.

For the purposes of this study, the SCERTS model (Prizant et al., 2006) and the work of Wetherby and Lord (as cited in Lord, 2008) provided a framework for observing the state of the child and environment and determining whether the child was available for learning. The behaviors specified by Bellini et al. (2007) were used as parameters to objectify reciprocal social interaction, or active engagement. It is important to note that, although Bellini et al. (2007) did not code prompted social interactions as social engagement, they were recorded as active engagement in this study based on their inclusion in the SCERTS and Early Social Interaction Project definition under "responding to verbal bids for social interaction." A model of all factors influencing whether or not a child was considered actively engaged is depicted in Figure 1-1.

There are several hypotheses as to why people with autism have difficulty engaging with others. One such hypothesis involves suspected differences in attention mechanisms. Joint attention, an early milestone in typical child development, may be demonstrated through gestures or vocalizations and eye gaze intended to draw another person's attention to an object or event of interest and establish joint reference (Mundy, Sigman, & Kasari, 1990). Children on the spectrum may fail to demonstrate this capability to engage others in a shared experience as well as respond to others' bids for joint attention. Rather, they may be fully absorbed and perseverate on the object of interest. Landry and Bryson (2004) provided evidence of the general difficulty young children with autism have in visually disengaging from an object of focus and shifting attention to competing stimuli, although neither stimulus in their experiment was social in nature. Compared to typically developing children and children with Down Syndrome, Dawson, Meltzoff, Osterling, Rinaldi, and Brown (1998) found that children with autism were less likely to orient to stimuli overall, with the largest discrepancy occurring in the presence of social stimuli. They hypothesized that the difficulty with shared attention in autism is the consequence of "a more basic failure to selectively attend to social stimuli, such as another person's eyes or facial expression (p.484)." In another study (Swettenham et al., 1998), infants with autism demonstrated a higher incidence and duration of attention towards objects than people. Attention shifting was characterized by more frequent shifts between objects than between nonsocial and social or two social stimuli; a pattern opposite of that which was found in the developmental delay and normal groups. Thus, it may be that people with autism avoid stimuli which require processing of or engagement in social complexities; they are object rather than people-oriented.

Neuro-imaging research, which attempts to account for differences in the processing of social information based on concrete measurements of brain activity, may offer a more

comprehensive explanation of problems engaging. Active engagement requires a number of interpersonal behaviors that are less prevalent in people with ASD (for example, eye contact, sharing of emotions, and reading nonverbal cues). These interpersonal behaviors are at the crux of social cognition. Social cognition relies on one's ability to perceive the interpersonal behaviors of others, or social stimuli in the environment, and adapt one's own social behavior accordingly (Adolphs, 2001, as cited in Pelphrey, Adolphs, & Morris, 2004). It is possible that neurological deficits in social cognition are due to reduced overall functional connectivity between systems as well as abnormal activation of the amygdala, superior temporal sulcus, and fusiform gyrus areas involved in recognition and attribution of meaning to social stimuli (see Pelphrey et al., 2004 for review). Two theories arise: 1) people with autism actively avoid social stimuli, or 2) they fail to understand significance in social stimuli. Either way, social attention demands complex, rapid processing and integration of information in these areas and other systems that control speech and language processing.

Motivation and Theory of Mind (ToM) development may also be factors influencing active engagement. People with ASD may lack awareness that knowledge, experiences, and interests are not a shared collective (Janzen, 2003). Internal and external motivation to communicate and interact socially is derived from this individuality, not only in what, but also in the way we experience. A ToM deficit may prevent them from implicitly understanding people as something of value, and deserving of attention. Interestingly, Mundy (2003) suggested that joint attention and ToM skills overlap in their activation of dorsal medial-frontal cortex and anterior cingulate, along with other ventral social areas. These early and later developing components of social cognition contribute to engagement at progressing levels of social complexity.

People with ASD have been hypothesized to have a narrower range of optimal arousal (Klinger & Dawson, 1992), or ideal mode for learning. It may be difficult or impossible for them to filter out or modulate internal and environmental sensory stimuli, so this bombardment of background information is muddled in with relevant information (Janzen, 2003). Engagement can be affected by a child's sensory regulation because of the competition for resources. If the child is focusing too much effort on dealing with the more pressing need for regulation, decreasing or seeking out sensory stimuli, fewer faculties are available to deal with interactions outside him or herself.

Parent Training/Family-Centered Treatment

Currently, there exists a push for intensive early intervention with the inclusion of family as a part of the intervention team. Research has shown that treatments with successful outcomes are consistent in that intervention is intensive with a strong family component (Dawson & Osterling, 1997). At this early stage, it is likely that family members are the most frequent, familiar presence in a child's life, and thus have the most potential to influence their development.

One popular method of involving parents in intervention is parent training and education. Parent-administered intervention is naturalistic; it automatically occurs in the child's daily environment, in the course of daily life (Ogletree, Oren, & Fischer, 2007). This is especially beneficial for this population because children with autism frequently have problems applying skills outside the learned context (NRC, 2001). Working within natural interactions eliminates much of the generalization phase of skill acquisition. Parent training programs generally promote increased spontaneous communication, communicative forms and functions, and adult's awareness of child's focus and interactive opportunities (Prizant, Wetherby, & Rydell, 2000).

The literature also supports parent training as an evidence based practice. Studies have proved that, with education, fathers of children with ASD can administer communication intervention strategies effectively (Seung, Ashwell, J. Elder, & Valcante, 2006; J. Elder, Valcante, Yarandi, White, & T. Elder, 2005). The researchers chose to train fathers specifically in their protocol due to the general trend in parent training of mothers as the primary target. The in-home training focused on teaching fathers to employ expectant waiting and imitation with animation strategies. Participants were able to apply skills in interactions with their children, and create a more balanced conversation. Child outcomes included positive gains in quantity and variety of single word utterances. Additionally, similar parent and child outcome measures in father-child and mother-child interactions showed that fathers were able to teach learned skills to a spouse.

Many parent training programs have been developed and investigated for parents of children on the autism spectrum (NRC, 2001). One parent training program operated through the Center for Autism and Related Disabilities (CARD) at the University of Florida was More Than Words- The Hanen Program for Parents of Children with Autism Spectrum Disorder (Sussman, 1999). This particular program was selected for its emerging research base, parent-friendly lesson plans, family-centered philosophy, and the presence of a program certified-SLP on staff at CARD. The program itself is naturalistic, promoting parents' identification and capitalization on teachable moments in daily interactions with their children. Children do not receive direct intervention through the program; rather, intervention is administered by parents based on what they've learned. The intervention format of More Than Words consists of an orientation and pre-program consultation, 8 small group parent sessions, and 3 individualized in-home feedback sessions. Specific strategies emphasized in small group trainings include providing motivating

opportunities to communicate, waiting expectantly, allowing focus of the interaction to be child-directed, modeling language, embedding goals within routines, and breaking down language to ensure comprehension (Sussman, 1999).

Two studies have been published to date on More Than Words- The Hanen Program for Parents of Children with Autism Spectrum Disorder. The first study (McConachie, Randle, Hammal, & Le Couteur, 2005) found that parents were indeed able to learn the facilitative strategies. Data also revealed significant gains in vocabulary for the group of children whose parent received training versus the control group. They failed, however, to detect any significant change in children's social interaction skills via the social-communication algorithm score of the Autism Diagnostic Observation Schedule (Lord et al., 2000) or problem behaviors related to intervention.

Girolametto, Weitzman, and Sussman (2007) attempted to fill the gap of information on the program's effect on social interaction. Their multiple case study first looked at parent responsivity to a child's communicative act to measure the extent to which adults were capitalizing on opportunities and using strategies to promote conversation. Responsivity was calculated based on parents' questions and comments intended to generate additional child responses. Instances of responsivity were subdivided based on context, whether comments immediately followed a child's communicative act or unengaged behavior. Results showed that all parents increased responsiveness, although parents varied in the context in which they improved. This responsiveness was viewed as the mechanism through which the child variables were influenced. Novel child-related dependent variables examined by Girolametto et al.(2007) included the rate of communicative acts, social reciprocity in communication, and initiation of social interaction. Social reciprocity was judged based on length and frequency of turn taking

interactions. All three child subjects demonstrated gains in the first two areas, with mixed results in the latter. The researchers were also able to replicate the previous findings (McConachie et al., 2005) of accelerated vocabulary growth.

Strategies within the program are packaged and presented through language devices such as acronyms, rhymes, and alliteration. In this way, the program provides a framework to aid parents' acquisition, storage, and retrieval of knowledge. Though the professional jargon is minimized, the individual strategies comprising More Than Words are well-supported by the speech-language literature and practice (The Hanen Centre, 2007).

Parents are taught to offer **communicative temptations** (Wetherby & Prizant, 1989), which are motivating opportunities for their child to communicate. Examples of communicative temptations include arranging the environment by putting preferred items in view but out of reach, providing desired stimuli in small increments, offering choices, and sabotaging known routines. When an opportunity is presented, the child must express what he or she wants in order to obtain it. Thus, these strategies encourage the child to request, comment, show, protest, and repair communication breakdowns. Although expectant waiting could be considered a communicative temptation, it is presented in the program as a vital step in the effective execution of any temptation. A form of time-delay, **expectant waiting** is discussed as it relates to giving the child with autism the opportunity to respond to the issued temptation. It supports spontaneous communication by allowing extra time to process, understand, and formulate an appropriate response. As execution of expectant waiting involves pausing and employing natural cues such as facial expression, intonation, and eye gaze, the child also gains experience with nonverbal cues that allude to the expectation of communicative reciprocity. Waiting is an important technique particularly for this population, as parents of children with autism may compensate for

lapses in interactions by increasing their utterances, which further limits the child's opportunities to respond (Siller & Sigman, 2002). By reducing their own speech and increasing their child's opportunities through communicative temptations and waiting, the adult promotes a more appropriate balance of conversational turns. More regimented time delay procedures have been used in studies of children with ASD to target spontaneous speech specific to a particular situation or stimulus (Charlop, Schreibman, & Thibodeau, 1985; Charlop & Trasowech, 1991; Taylor & Harris, 1995). A baseline opportunity to spontaneously produce the desired behavior (e.g., Taylor & Harris, 1995) or expectant waiting was implemented first, followed by a model with a graduated time delay between stimulus presentation or opportunity and cue. This procedure proved effective in teaching responding (Charlop et al., 1985), spontaneous speech in natural daily environments (Charlop & Trasowech, 1991), and requesting information ("What's that?") (Taylor & Harris, 1995).

One of the core concepts of the MTW program is allowing the child's focus to direct the interaction. By being sensitive to the **child's interests**, parents may reduce demand involved in shifting attention, identify an intrinsically motivating activity, and maximize joint attention by converging on the object or event on which the child is already attending. Research shows it also results in the best communication outcomes (Siller & Sigman, 2002).

More Than Words incorporates **imitation, modeling, recast, and expansion** techniques to establish interaction, and then advance communication. Dawson and Adams (1984) suggested that children with autism still developing imitation are most socially responsive to imitations of their own actions. Imitation likely emphasizes to these children the power of his or her actions. It also reinforces reciprocity as the child begins to anticipate and react to adult imitations and learns to switch roles. From imitation, expansion is an important step to build on the child's

existing language forms and concept knowledge. Goals that are below one's capabilities limit learning opportunities, but high demand without support can cause extreme frustration and similarly stall skill development (Janzen, 2003). Learning requires that the adult continuously reassess a child's progress, adjust goals to create challenges, and scaffold supports to facilitate success. Scaffolding language for this population may involve providing a model or recast for the gestalt learner to understand the appropriate communicative behavior. Research by Scherer and Olswang (1989) reported that adult use of modeling and expansion furthered growth in language of the child with autism. In their study, children were successful in imitation of the initial model and the expanded form, and then progressed into spontaneous productions of expansions. Literature also shows that children can acquire new forms of language syntax through maternal recasts (Baker & Nelson, 1984).

Schuler (1995) noted central differences in information processing in autism, with strengths in visuo-spatial and rote memory skills. Interventions may capitalize on the strengths of people with ASD by utilizing routines and visual supports to bolster learning (Ogletree et al., 2007). **Visual supports** can be used to foster literacy and comprehension of concepts, ease transitions, and reduce anxiety and behavioral displays by providing predictability (Hodgdon, 1995). Visual supports act as a concrete, permanent reference; a rule-based system to attribute meaning and limit the need to abstract. **Routines** have a similar appeal in that they follow an established procedure, relying heavily on rote memory. Opportunities are predictable and sequence is defined for active participation in exchanges. This enhances knowledge of communicative reciprocity (Prizant et al., 2006). Moreover, routines can be manipulated to expand goals though role exchange, sabotage, child initiation, inclusion of new people and objects, etc.

Methods of **ensuring a child's comprehension** of language are broken down into two modalities. Verbal output is simplified to highlight key words, and visual references are provided to help the child link language to meaning (Harris, Jones, Brookes, & Grant, 1986).

The coaching and video self-modeling component of the MTW program is designed to ensure parents are successful in creating opportunities and applying the above strategies in their natural environment to increase reciprocal interactions. **Video self-modeling** involves reviewing video of oneself performing an adaptive behavior in order to learn skills or modify behaviors to reflect goals (Dowrick, 1999). With the **coaching** element, parents receive positive reinforcement from the speech-language pathologist. Coaching also allows for pre-planned and real-time development of feedforward modeling opportunities (Dowrick, 1999), in which new combinations or contexts for fragments of attained skills are orchestrated to display novel skills slightly above their current abilities. In his summation of video self-modeling applications, Dowrick (1999) concluded that, in self-observation, learning occurs from one's own successes and adaptive behaviors. It is possible that this in turn increases the probability of the behavior being displayed again. Positive outcomes of video modeling and self-modeling interventions for children and adolescents with ASD have contributed to its consideration as an evidence-based practice (Bellini & Akullian, 2007). Video self-modeling has been previously utilized as a component of parent training as well. A study incorporating video self-modeling and feedback into an intervention for first-time fathers resulted in improved interaction skills (Magill-Evans, Harrison, Benzies, Gierl, & Kimak, 2007), and provided evidence to support the use of this technique in the parent training domain. J. Elder et al. (2005) also used video self-modeling to support fathers' acquisition of social reciprocity-promoting skills.

Research Questions

While prior studies on More Than Words- The Hanen Program for Parents of Children with Autism Spectrum Disorder have provided valuable information on parents' ability to alter interaction styles and the subsequent vocabulary growth of children, they fail to address the child-related goal emphasized across strategic elements of the program, and underlying all child achievements. Although the majority of goals are individualized, and the program is not a direct intervention for children, it is hypothesized that all subjects would show improvement along the active engagement variable based on the assumptions that (1) parents alter interaction styles and implement strategies learned during parent training (Girolametto et al., 2007) and (2) teaching strategies through parent training enables parents to act as a transactional support.

Engagement is a central component to all learning. Prioritizing this critical goal that is a deficit in the learning style of autism (Janzen, 2003) paves the way for teaching and development of other meaningful skills. To determine whether parents were able to address this goal, the following question was posed: Did the proportion of time a child was actively engaged with partners change over time with the implementation of parent training?

To investigate these questions, a single-subject design was employed. The experimental design was selected to most accurately depict the heterogeneity of this population by looking at individual differences. It was important to acknowledge as well the variability characteristic of ASD that occurs within an individual over time and across situations.

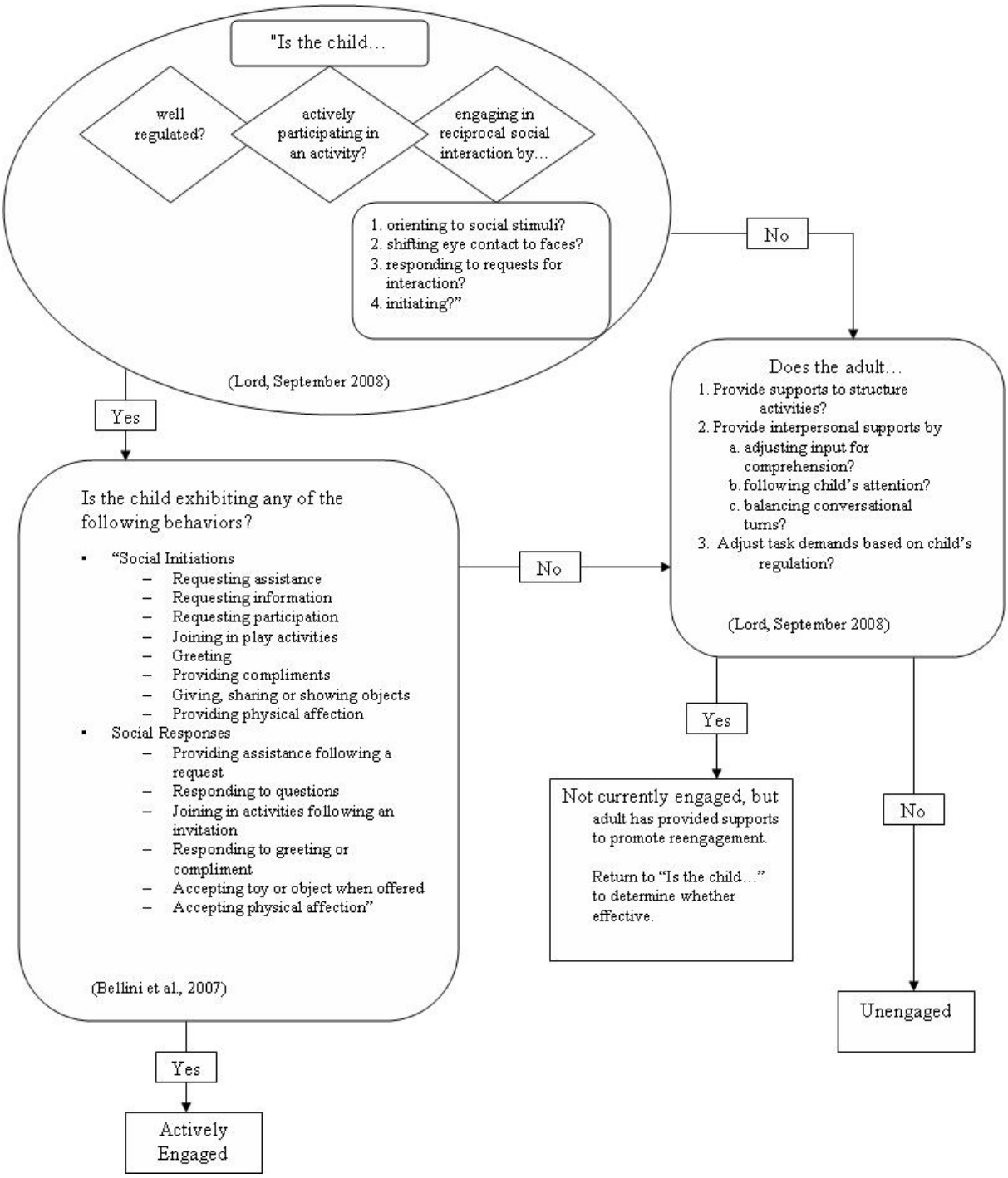

Figure 1-1. A model of decision-making for active engagement

CHAPTER 2
METHODS

Subjects

Selection

Families were identified from the constituent base of the University of Florida Center for Autism and Related Disabilities (UF-CARD) and given the opportunity to participate in the program based on staff recommendations. These potential participants were required to meet the following criteria to be considered eligible for the program.

- Children must be between the ages of 2.5 years and 5 years old. A latitude of plus or minus 6 months was exercised.
- Children must have a diagnosis from a physician or clinical psychologist as being on the autism spectrum.
- Families must be CARD constituents.
- Families must commit to attend and participate in the entirety of the program, including the 8 group sessions on-site at the CARD office, an in-home pre-program consultation, and the 3 scheduled home feedback visits.

Following an orientation on program format, participant investment, and goals, families were admitted to the program based on the order in which they committed.

Once admitted, families were given the opportunity to participate in the research protocol. As stated in the Internal Review Board Informed Consent, participation in the research was voluntary and did not influence inclusion in the parent training program. Families reserved the right to withdraw at any time. The sole perceived risk to subjects was the additional time demands, and the only known benefit was that families would be provided with copies of research videotapes for their personal archives.

Participants

Seven families elected to participate in the research component of the program. They are a subset of the eight families who participated in the inaugural MTW at CARD. Of those who participated in the research, a minimum of 10 tapings, including baseline, treatment, generalization, and maintenance data, was collected on four subjects. This minimum was the amount deemed sufficient for the chosen analytical method and interpretation. One of the four subjects was excluded from the current analysis due to a diagnosis of co-occurring apraxia of speech that he received post study onset. Cancellations of research tapings were due to illnesses, pre-existing travel arrangements, and family emergencies. Attrition of 1 family from the research occurred during the course of the research protocol due to the frequency of research tapings compounding the program's already intensive time commitment; however, all 8 families completed the More Than Words program. See Table 2-1 for research participant characteristics and the amount of data collected on each.

Three subjects, Adam, Michael, and Joe (pseudonyms), completed the research protocol and met criteria for this study. Further information on Adam, Michael, and Joe and their family characteristics is available in Table 2-2 and 2-3. Histories were obtained via parent report during CARD intake, professional reports provided to CARD by parents, and caregiver questionnaire. The Communicative and Symbolic Behavior Scales- Developmental Profile (CSBS-DP) Caregiver Questionnaire (Wetherby & Prizant, 2002) was issued to parents during the pre-program consultation to gain information on current abilities in social, speech, and symbolic domains. The questionnaire was completed by 2 of the 3 families (those of Michael and Adam). The third family (that of Joe) did not complete the questionnaire because the child seemed too developmentally advanced for this measure. Results are summarized in Table 2-4 and 2-5. The CSBS-DP is norm-referenced for ages 6 to 24 months, but may be used with children up to 6

years of age whose delays place them in that age range developmentally. Because subjects exceed the age for which normative data is available, results should be interpreted with great caution. Percentile ranks provided correspond to those of the highest age group (23-24 months), but cannot be accurately ascribed to abilities commensurate with chronological age. The tables also contain the age in months at which a given score is equal to the 50th percentile.

Information on subjects' present levels was also used to determine their MTW Hanen stages of communication. The program's division of stages based on interaction, communicative forms and functions, and comprehension served as a sort of initial evaluation, and a guide to identifying skill areas of need and selecting goals. The first communication stage is **"own agenda,"** where a child demonstrates minimal interest in others. General goals for children in the own agenda stage are to send intentional messages, understand routines, and use sounds and gestures to interact (Sussman, 1999, p. 59). At the next stage, **"requester,"** a child is displaying more intentional gestures and simple language to communicate wants. Goals include longer interactions, parallel play, joint attention, and using means of communication for social purposes (Sussman, 1999, p.61). Children at the third stage, **"early communicators,"** are requesting and using some social communication and joint attention towards adults. Goals may be to extend interaction length, communicate for a wider variety of social purposes, and interact with other children (Sussman, 1999, p. 62). The fourth and highest stage is that of **"partner"**. At this point, a child communicates for many reasons in longer sequences, but may be challenged to communicate more spontaneously and take on new roles in play (Sussman, 1999, p. 66).

Michael

Michael was a 4 year old male. His medical history is significant for some seizure activity. Although motor development was typical, his parents noted limited cooing and babbling. Michael was delayed on all verbal milestones, and demonstrated little to no joint attention or use

of gestures to communicate. At 2 years of age, he still showed little eye contact, shared enjoyment, or reciprocal engagement during play activities. Expressive vocabulary hovered around 5 to 10 words. His parents also noticed difficulty following directions and transitioning between activities.

On the CSBS-DP caregiver questionnaire, Michael's parents reported his strength in visual learning and interest in letters and numbers. Ability to share thoughts and feelings and understand how to interact socially were listed as specific areas of concern. Upon entry in the MTW program, Michael was classified as possessing characteristics of both own agenda and requester Hanen stages of communication.

Adam

Adam was a 4 years, 11 month old male. Adam's medical history is significant for static encephalopathy. The family had previously participated in a father-training study as well as another study involving teaching imitation and promoting spontaneous utterances through the University of Florida.

Speech-language evaluation two months prior to the start of the program revealed age-equivalent receptive and expressive language scores of 3 years, 8 months and 2 years, 9 months respectively on the Preschool Language Scale, Fourth Edition (Zimmerman, Steiner, & Pond, 2002). His standard score was 79 for receptive and 65 for expressive language. Age-equivalent for total language was 3 years, 2 months. The Goldman-Fristoe Test of Articulation (Goldman & Fristoe, 2000) was significant for articulation and phonological errors consistent with stopping, liquid simplification, backing, nasalization, deaffrication, devoicing, and distorted vowels. Adam demonstrated reading abilities without formal instruction suggestive of hyperlexia. Behavior was notable for impulsivity and inattention, but he responded well to verbal, tactile, and visual cues.

On the CSBS-DP caregiver questionnaire, Adam's parents reported his strengths in visual learning, reading, and fine and gross motor skills. Areas of concern included awareness of danger and attending to safety-related instructions, unusual sensory processing, and long-term educational issues. Upon entry in the MTW program, Adam was classified as being in the early communicator Hanen stage of communication. This determination was based on his ability to use language to request and occasionally share with adults, typically through echolalic means. Spontaneous speech and initiations were rare.

Joe

Joe was a 4 year old male. Joe's parents reported normal speech-language development and achievement of milestones until 2 years of age. At age 3 years, 1 month, he was diagnosed with delayed receptive and expressive language and delayed speech intelligibility. He completed 22 sessions of speech-language treatment, after which he was referred for ASD screening and diagnosis.

A speech-language evaluation 3 months prior to the start of this program indicated Joe's difficulty with verbalizing for joint attention, reciprocal play, and conversation. Rigidity in routines was also noted. An additional evaluation one month later suggested some articulation impairments as well as overall delays in social communication and receptive and expressive language. No formal testing could be completed on either date due to disinterest in stimuli and inattention. Upon entry in the MTW program, Joe was classified as being in the partner Hanen stage of communication based on his ability to use spontaneous language for many reasons and participate in an extended interaction with adults. Interactive roles and play sequences were rigid, however, and Joe struggled with initiations.

Procedures

Intervention

The intervention utilized for this study was MTW, an intensive parent education program developed at The Hanen Centre. Intervention was administered by a program-certified speech-language pathologist over 11 weeks, during which parents attended eight 2.5 hour lessons in a small group format at the CARD-UF office and received three 2 hour individualized in-home sessions.

The program divides children into four different language stages (own agenda, requester, early communicator, and partner) based on forms of communication used for various contexts and intents. During the pre-program consultation, parents received a worksheet to assist them and the speech-language pathologist in determining their child's stage of communication and selecting goals. Goals targeted throughout the program are based on language stage and the individual child; however, broad aims of the program include (a) increased joint interactions, (b) more advanced and typical methods of communication, (c) improved social communication skills, and (d) a better understanding of language (Sussman, 1999).

In small group sessions, parents were taught to employ several core strategies in order to facilitate progress toward and achievement of broad and individualized goals. Core strategies include offering communicative temptations and expectant waiting, modeling and expanding/recasting language in child-directed interactions, using routines and scripts, and promoting comprehension through the use of visual aids and other altered input. For example, during the first session, parents were encouraged to analyze their child's sensory preferences and determine the types of activities that might enhance motivation. Capitalizing on these highly preferred sensory activities, parents were taught to incorporate temptations in order to draw out communication. To maximize parents' transfer of knowledge from class to everyday situations

with their children, sessions 3, 6, 7, and 8 specifically addressed targeting goals in the context of playing “people games” (e.g., hide-and-go-seek), singing songs, reading books, playing with toys, and peer interactions, respectively. See Table 2-6 for a complete list of session topics.

Scheduled individual sessions involved visiting the home of each family, helping to develop a series of planned activities in which to accomplish goals over a 20 minute parent-child interaction, and providing on-line coaching throughout the interaction. Visits concluded with a form of video self-modeling, whereby parents viewed the videotaped events with the speech-pathologist, self-critiqued, and were offered feedback. Interactions were recorded via two video cameras manned by student volunteers. When the parent-child interaction was complete, one videotape was used for viewing with the family, while the other was left running to record the feedback segment of the home visit. Individualized home sessions occurred in the week following the third, fifth, and seventh small group lessons. Activities varied across the three tapings based on the lessons taught during the prior weeks. Video self-modeling and coaching highlighted parents’ use of interaction-promoting strategies taught during small group sessions. Through coaching, the speech-language pathologist was able to offer real-time suggestions and alternatives when an activity or strategy was ineffective, as well as verbal praise and possible modifications and expansions of achieved goals. In this way, home sessions were designed to facilitate successes. Video self-modeling allowed parents to analyze their own successes and challenges. They were able to see what worked, what didn’t, and why by reviewing antecedents, resulting behaviors, consequences, and adjustments they made by employing strategies.

Data Collection

Research visits

Volunteers from the Child Language Lab in the Communication Sciences and Disorders department at the University of Florida were assigned to families participating in the research.

Research visits involved a 20 minute in-home videotaping of an interaction between the child and one or more parents during five categories of activities. Categories were as follows:

- A physical game without toys (e.g., Peek-a-boo, Ring around the Rosie, chasing games, tickle games)
- Singing a song together.
- A daily routine (e.g., snack, washing hands, lunch, getting dressed). The routine will depend on the time of day of the appointment.
- Looking at a book together.
- Playing with a favorite toy together.

Parents were allowed to select the order of activities as well as the specific activity within each category. Recording was stopped or paused at any time during the research visit in accordance with parents' requests.

Volunteers attempted to collect 3 baselines prior to the start of the program, one taping during the week following each of the 8 sessions, and 2 follow-ups after the program concluded. Although tapings were specified as a 20 minute event, lengths of research recordings varied. Table 2-7 displays the conversational partners for research tapings of each of the 3 subjects.

Transcription and coding

After the samples were collected, volunteer research assistants transcribed the video recordings to reflect all parent and child utterances produced over the course of each research visit. Second pass transcriptions were performed by pairs of research assistants who had not participated in the primary transcription of the samples assigned.

All but 4 samples were independently analyzed and coded for behaviors by a research assistant uninvolved in program planning and implementation, data collection, or utterance transcription. The coding process consisted of recording and time stamping each behavior the child exhibited, and coding whether or not a behavior signified the child's active engagement.

Review of the primary coder's first three behavioral transcriptions by one of this study's investigators confirmed that behaviors coded as active engagement could be classified within the broader initiating and responding behaviors indicative of "active participation" described by Bellini et al. (2007). Behaviors coded as not engaged failed to meet those criteria; these were frequently classified as avoidance behaviors. Baseline and week 1 samples for Michael were coded by an investigator of the study.

Reliability

Reliability of active engagement was not completed at this time for this study.

Table 2-1. Participant characteristics

Child name*	Age at study onset	Sex	Total research tapings	Attrition	Diagnosis
Michael	4;0	M	3 baseline, 7 weekly, 2 follow-up	N	PDD-NOS
Bob	2;8	M	3 baseline, 5 weekly, 2 follow-up	N	Autism
Joe	4;0	M	3 baseline, 6 weekly, 2 follow-up	N	Autism
John	3;5	M	3 baseline, 2 weekly, 2 follow-up	N	Autism
Adam	4;11	M	3 baseline, 6 weekly, 1 follow-up	N	Autism
Sam	5;7	M	1 baseline, 7 weekly, 1 follow-up	N	PDD-NOS
Jane	3;10	F	3 baseline, 1 weekly, 0 follow-up	Y (Research)	PDD-NOS

*Names are pseudonyms.

Table 2-2. Adam, Michael, and Joe characteristics

Child	Age	Age at diagnosis (in months)	Diagnosis	Hanen stage	Education	Other services received
Adam	4;11	36	Autism	Early communicator	Attending preschool	Speech-language therapy
Michael	4;0	PDD 27 Autism 31	Autism	Own agenda/ Requester	Attending preschool	Speech-language therapy 3 times per week. Occupational therapy 3 times per week
Joe	4;0	47	Autism	Partner	Attending preschool	Speech-language therapy 2 times per week Occupational therapy 2 times per week

Table 2-3. Adam, Michael, and Joe family characteristics

Subject	Parent education	Ethnicity	Sibling sex/age
Adam	Father- Master's degree Mother- Associate's degree	Caucasian	None
Michael	Father- Medical doctorate degree Mother- Master's degree	Arabic / Caucasian	Female: 6;4 Male: 5;0 Female: 2;0
Joe	Father- Master's degree Mother- Master's degree	Caucasian	Female: 6;3

Table 2-4. Michael CSBS-DP results

	Weighted raw score	Percentile [a]	Age equivalent (mos.) [b]
Emotion and eye gaze	7	1	
Communication	9	2	
Gestures	6	1	
Sounds	14	50	
Words	13	37	
Understanding	13.5	9	
Object use	19	25	
Social composite	22	1	8-9
Speech composite	27	37	19-20
Symbolic composite	32.5	9	15-16
Total	81.5	7-8	~14

Social composite is comprised of emotion and eye gaze, communication, and gesture cluster scores. Speech composite is comprised of sounds and words cluster scores. Symbolic composite is comprised of understanding and object use cluster scores. The total is the sum of the three composite weighted raw scores.

[a] Calculated based on the top age range of the test, 23-24 months.

[b] Age equivalents are not provided by the CSBS-DP manual, but were calculated based on the age in months at which the given score was equal to the 50th percentile.

Table 2-5. Adam CSBS-DP results

	Weighted raw score	Percentile [a]	Age equivalent (mos.) [b]
Emotion and eye gaze	14	63	
Communication	14	9	
Gestures	10	9	
Sounds	16	99	
Words	23	75	
Understanding	23	50	
Object use	18.5	25	
Social composite	38	16	13-14
Speech composite	39	84	Not available [c]
Symbolic composite	41.5	37	19-20
Total	118.5	~47-50	~23

Social composite is comprised of emotion and eye gaze, communication, and gesture cluster scores. Speech composite is comprised of sounds and words cluster scores. Symbolic composite is comprised of understanding and object use cluster scores. The total is the sum of the three composite weighted raw scores.

[a] Calculated based on the top age range of the test, 23-24 months.

[b] Age equivalents are not provided by the CSBS-DP manual, but were calculated for composite and total scores based on the age in months at which the given score was equal to the 50th percentile.

[c] Age equivalent could not be calculated because subject exceeded 50th percentile at all ages for which normative data is available.

Table 2-6. The Hanen More Than Words program session outline

Session	Topic	Phase
1	Understanding the way your child communicates and his or her sensory systems Communicative temptations	Treatment
2	Child-directed strategies • modeling language at an appropriate level • expanding on and recasting child's communicative attempts	
3	"People games" Singing songs	
4	Promoting comprehension • altering language complexity Using routines and scripts	
5	Visual supports • alternate modalities of comprehension and expression	Generalization
6	Reading books	
7	Playing with toys	
8	Peer interactions	

Table 2-7. Conversational partners in research tapings

	Michael	Joe	Adam
Baseline 1	Father/Mother	Mother	Mother
Baseline 2	Mother	Mother	Father/Mother
Baseline 3	Father	Mother	Father/Mother
Week 1	Father	Mother	Mother
Week 2	Mother	Mother	Father/Mother
Week 3	Father	-----	-----
Week 4	Father	Mother	Mother
Week 5	Father	-----	Mother
Week 6	Mother	Mother	Mother
Week 7	Mother	Mother	Mother
Week 8	-----	Mother	-----
Follow-up 1	Father	Mother	Mother
Follow-up 2	Father	Mother	-----

CHAPTER 3
RESULTS

To test the hypothesis that the proportion of time a child was actively engaged with partners would change over time with the implementation of parent training, visual inspection of graphed data was performed. Graphs and raw data are provided for each subject of the proportion of time actively engaged during each session over the course of the baseline, treatment, generalization, and maintenance phases of the program (see Figure 3-1, 3-2, 3-3; Table 3-1).

Parents were trained in the core strategies of More Than Words during the first 4 small group parent sessions. This period of time was classified as the treatment phase. Rather than isolate a generalization phase, this experiment employed an additional "follow-up," or maintenance phase, after all other program elements had ceased. The generalization phase was defined as that in which the focus of remaining educational small group sessions and home visits shifted from the teaching of core interaction-promoting strategies to support of situational application of strategies and skills in songs, books, toys, and involving peers. This study's division of data into what was perceived as a separate generalization phase created a smoother continuum along which to analyze efficacy based on incremental removal of program supports. It more closely reflects the natural transitions and expectations in all skill learning and acquisition, and lends itself to a more comprehensive interpretation. In the interest of full disclosure, the consideration of all potentially relevant segments avoids presenting only those which conform to hypotheses or might falsely inflate treatment effects. Thus, each of these outcome phases and their combination are analyzed with respect to baseline measures to maximize information.

On visual inspection, changes can be seen in the proportion of each session for which Michael was actively engaged over the course of this investigation (Figure 3-1). The graph indicates that a high percentage of time was spent engaged in the first baseline, but engagement

dropped off dramatically over the remaining baselines. The lowest levels of engagement (one percentage point below the lowest baseline) occurred during week 1 of the treatment phase, 8 days after the last baseline was collected. From week 1 to week 2, the data exhibited a marked increase, nearly equivalent in magnitude to the negative change over the three baseline points. At no time did the slope between consecutive weeks approach that of the three baselines or week 1-to-week 2. Percentage of time actively engaged fluctuated in the remaining weeks, resulting in a step-like pattern with a generally positive trend over the latter three phases. Furthermore, a positive directional change was evident between the first and last points of treatment, generalization, and maintenance phases individually, with the overall highest proportion of engagement occurring during the last maintenance session. Two of three generalization and all maintenance points exceeded baseline range. Only the first generalization point demonstrated overlap.

Joe began with a high percentage of active engagement, as shown in his baseline measures. A fairly low amount of variability was also demonstrated in baseline, with all observations falling within ten percentage points of each other. Visual inspection of graphed data (Figure 3-2) shows no obvious trend. On generalization, however, there were two data points above and one overlapping the high baseline range, suggesting some improvement. The highest recorded engagement overall was week 8, immediately following the last program session. A declining slope was evident between the two maintenance points, with one falling within and one below the range of baselines, demonstrating a decline in engagement in the months following program termination.

Visual inspection of Adam's graph (Figure 3-3) shows no apparent pattern in the data. Similar to Joe, Adam experienced a fairly stable baseline, with no more than ten percentage

points between observations. Engagement dropped dramatically in the first treatment week, but returned to near baseline the following session. Two of the three generalizations and the sole maintenance point somewhat exceeded the range of baseline data, but no consistent trend was evident as the one generalization point which overlapped was the final generalization sample. This generalization point also demonstrated a drop of over ten percentage points from the prior session's data.

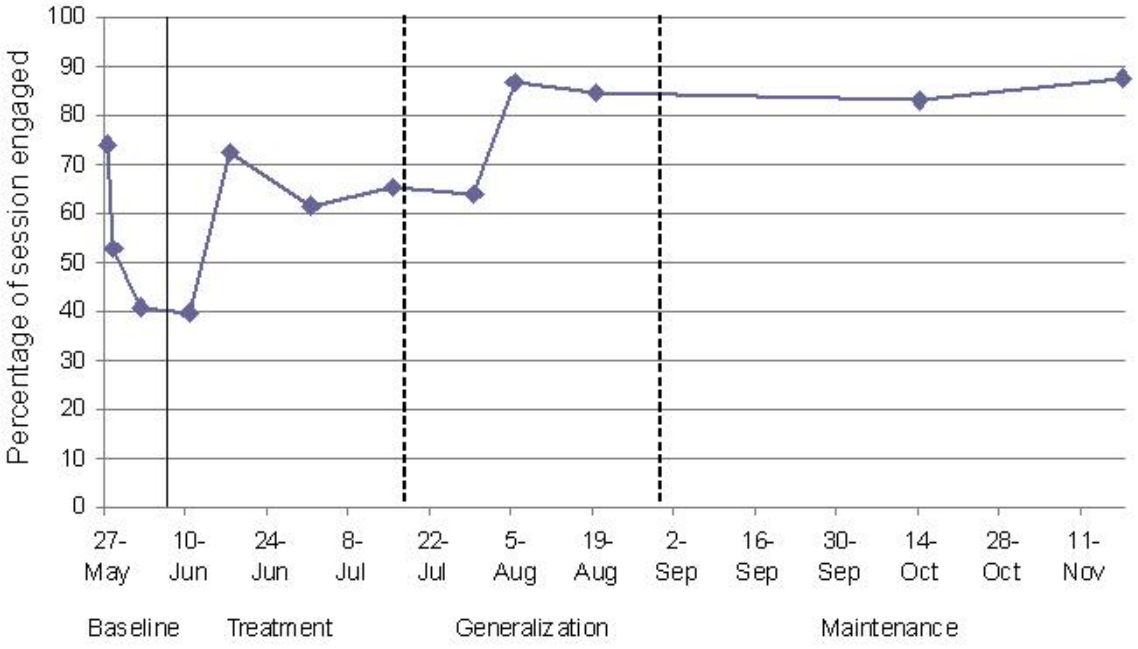

Figure 3-1. Graphed representation of Michael's active engagement data for a parent training intervention.

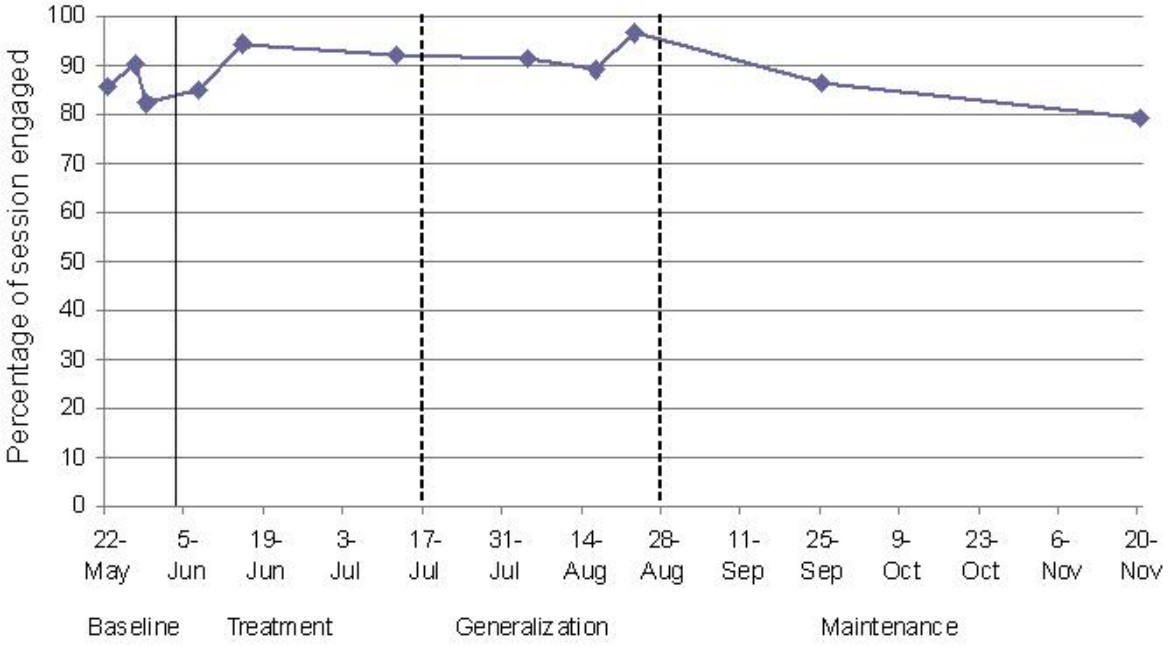

Figure 3-2. Graphed representation of Joe's active engagement data for a parent training intervention.

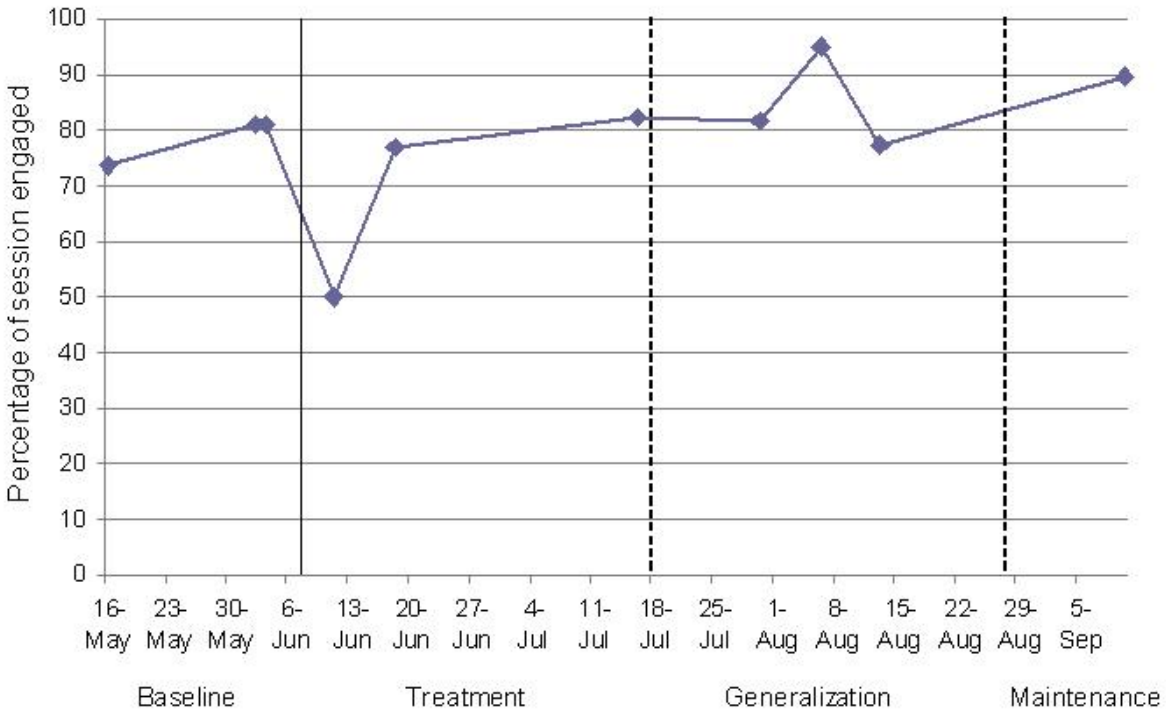

Figure 3-3. Graphed representation of Adam's active engagement data for a parent training intervention.

Table 3-1. Raw data of percentage of time engaged and length of each session

	Michael		Joe		Adam	
	% Time Engaged	Session length	% Time Engaged	Session Length	% Time Engaged	Session Length
B1	74.1	14:42	85.5	23:28	73.6	16:21
B2	53.0	21:00	90.1	20:02	81.0	23:17
B3	40.7	12:17	82.2	20:08	80.9	33:53
W1	39.7	19:27	85.0	22:13	50.1	20:06
W2	72.3	19:57	94.2	23:18	77.0	21:59
W3	61.5	12:15				
W4	65.1	18:03	92.0	20:05	82.4	20:07
W5	63.8	15:46			81.7	18:47
W6	86.7	19:59	91.3	21:46	94.9	25:07
W7	84.7	18:12	89.1	20:30	77.4	24:05
W8			96.5	20:37		
F1	83.0	19:33	86.5	20:42	89.6	31:23
F2	87.6	18:29	79.4	18:34		

CHAPTER 4
DISCUSSION

This study investigated whether the proportion of time a child was actively engaged with partners changed over time with the implementation of parent training. Outcomes varied across children in different communication stages, with data trends more difficult to detect in the higher stages. Overall, the only subject at the lowest communication stage experienced a large change over both generalization and maintenance.

Michael's positive trend across all potential pre and post program measurement groupings demonstrates his significant magnitude of change over the course of the parent training, and suggests a sizeable treatment effect of parent-implemented intervention on his active engagement. One threat to the interpretation of this subject's data particularly is the short time over which baselines were collected. This occurred because time available to collect this data was limited to the period between a family's pre-program consultation and the first session (a maximum gap of 2.5 weeks), and only 4 weeks separated the orientation and program onset. It is unclear whether the lack of stability in Michael's baseline is a consequence of the limited number of data points and time period over which they were collected or the large variability in skills and behaviors that is commonly characteristic of ASD. It is also possible that the participation of both Michael's mother and father in the first baseline research taping (the only sample in which both were included) resulted in a false inflation of his levels of social interaction with respect to the other samples. Failure to obtain a stable baseline makes it more difficult to definitively attribute changes to the treatment effects. However, the downward trend in successive baseline points, along with the overall positive slope of the data through the treatment, generalization, and maintenance phases, still lend support to the conclusion that Michael's active engagement increased over the course of the parent training program. Future

researchers into More Than Words should be aware of the time period between orientation, pre-program consultation, and the first group session and plan baseline collection accordingly. Compensation could be made through a larger gap between the consultation and program onset and/or conducting orientations once per every few program cycles. The latter would require extension of invitations to more families per orientation, and the institution of a 'waiting list' whereby additional baseline data are gathered during the waiting period.

While it is possible that over a larger amount of time Michael's baseline levels of active engagement would have stabilized, the pattern demonstrated in those few data points relative to that of the post-strategy instruction phases may also provide information of value. Michael achieved greater stability on the measure during treatment generalization and maintenance, as shown by the change in the range of scores of generalization and maintenance (23.8) as opposed to baseline (33.4). Further, on the last four data points the proportion of the session for which Michael was engaged consistently fell in the eighties, with the highest and lowest scores separated by only 4.6 percentage points (83.0-87.6%). The amount of time between the program conclusion and collection of maintenance data provides additional support for the increase in stability. Follow up visits were conducted over approximately 2.5 months following the program at fairly equivalent intervals. Michael was able to maintain achieved levels over this period. His steady, step-wise improvements over the course of the protocol add support that changes were not random or a result of outside factors. These results may suggest that the introduction of a naturalistic, child-centered intervention provided on a daily basis by his primary caretakers helped Michael attain higher and more consistent levels of presence in an actively engaged state.

It is contended here that stability of Michael's performance is as crucial as the magnitude of his change, if not more so, because it represents the level of accessibility, application, and

generalization of skill sets and behaviors, and whether the function and value of a behavior is truly understood. This finding of improved consistency, albeit unintentional, is an important outcome for a population that exhibits such discrepancies in behaviors day to day.

On visual inspection of his data, Joe did not appear to demonstrate many changes, significant or otherwise, on the dependent measure as defined for the purpose of this study. No true trend is evident in his graph (Figure 3-2). Although Joe's generalization level does appear to exceed that of baseline somewhat, based on the declining slope of the maintenance points no long-term active engagement effect can be attributed to treatment. Parent report and clinician observation led to Joe's classification as the most advanced communicative stage addressed by the program (partner). His high, stable levels of active engagement during baseline suggest that he already learned, generalized, and valued engagement. The remaining proportion may indicate that the subject has hit a ceiling and reached the maximum allocation of his engaged resources, or it may be beyond what can be reasonably expected for any child this age. Either way, it appears that once a child is capable of high, stable measures of engagement and is consistently available to learn, the measurement itself loses its significance as a pre-learning tool. It is also possible that program strategies targeting engagement are more suited to a lower developmental level, as increasing engagement is not a true goal at the partner stage.

In their exit survey, Joe's parents anecdotally reported the emergence of more complex, interactive play behaviors and communication. They noted dramatic differences in his interest in engaging in pretend play in particular and his spontaneous initiations of such play. Thus, future research may choose to bypass discrete yes or no coding of engagement and instead provide more descriptive measures of the complexity of social engagement behaviors, consistent with the goals of children using higher levels of communicative forms and functions at program outset. It

may also be interesting to examine the frequency and complexity of social behaviors exhibited by children at various stages with respect to levels of engagement. This would benefit from a longitudinal sample of parent-child interactions in a group of typically developing children matched for age or language against which to compare patterns of engagement and the interactions between engagement and social skill development. Normative data would allow for improved understanding of whether a ceiling exists for engagement, as well as whether a lower proportion of time engaged precludes the emergence of more complex social behaviors or whether overlap commonly occurs. Ultimately, this may help to answer more of parents' questions about expected outcomes.

Adam demonstrated no true change in active engagement on visual inspection of his data. Despite the presence of 3 data points in generalization and maintenance above baselines, the apparent lack of any trend supports the likelihood that these are random variations. The fact that Adam's final (and sole) maintenance sample was near the ninetieth percentile and his initial baseline was around the seventy-fifth adds a cautionary note to the risk inherent in comparing only pre and post program measures to document change, as they would have likely supported the determination of a large treatment effect in this case. It also suggests the importance of monitoring post treatment change for maintenance of improvement. As an early communicator, it is probable that Adam's high, stable baseline indicate that was already capable of engaging, and similar to Joe, no longer required additional focus on this skill area.

Limitations

There are several threats to the validity of this experiment. One potential confound is the participation of both parents in data collection tapings. Although some families remained consistent in which parent was involved, Michael's parents requested and were permitted to alternate or participate jointly in tapings as they had both attended group lessons and home video

feedback sessions. Adam's family also chose to have both parents participate in research visits, though for them the mother brought home information and practice assignments from the small group sessions to share with the father. This variability in interaction partners is likely more representative of daily lives and the naturalistic intervention program, but especially with the small number of data samples, it may have adversely affected research validity. Future studies may wish to exercise stricter consistency with this aspect of data collection. Both parents may still be able to participate if a larger amount of data is collected, particularly an extended baseline, and random assignment of mother and father to each taping is employed. Other threats to validity include lack of controls for maturation and other therapies. In addition to the lack of inter-rater reliability checks, behavioral coding of Michael's baselines and first week samples was completed by a person other than the primary coder. Efforts were made to eliminate potential introduction of bias through time stamping both engaged and unengaged behaviors and calculating time totals only at the end. Correct classification of behaviors by the primary coder observed in the first three samples was confirmed, although videos were not viewed to confirm accuracy of time stamps or specific observations.

Summary

Differences in subject outcomes underscore the importance of looking within the group at individual differences when setting goals and implementing intervention. The children involved in this study were all at different Hanen stages of communication. If active engagement had been sole target of intervention, it is likely that this intervention would have been wasted on Joe, a partner. However, because goals were continuously reassessed and expanded upon during home visits, the program was able to be tailored to the strengths and weaknesses of each child. This is particularly important in a population that exhibits such variability between individuals and splintered skill profiles within individuals. The coaching and video self-modeling sessions also

allowed the program to address individual differences in parent interaction styles and adaptation and implementation of specific strategies relative to their child's needs, furthering their success as communication facilitators. For example, Michael's parents were advised to use a prolonged period of expectant waiting to accommodate for the extra processing time their son required rather than repeating the request or statement. Michael was then able to respond to their questions or express a request of his own. Early on, Joe was participating and communicating in all segments of the taping session as laid out on a visual schedule. When he expressed curiosity toward his father's use of puppets, the father was encouraged to follow this interest and add a new challenge by having each member of the family, child included, take on the role of the puppet. They incorporated this pretend play into several aspects of the interaction (singing, playing with toys, referring back to the schedule during transitions, an activity of daily living), and remained in character as long as possible. Shifting to Joe's focus facilitated his initiation of a topic and maintenance over an extended period of time and number of turns as well as his understanding and expression of abstract concepts of pretend and others' feelings and thoughts, all of which are goals at the partner stage.

From the pre-program consultation, one of Michael's goals at the own agenda/requester stage was reciprocating interaction (a component of active engagement). At the partner stage, Joe already had this piece, and through the strategies his parents employed, he was able to expand his repertoire of communicative knowledge and skills. It is crucial that goals are matched appropriately to communicative abilities during pre-screening. This study indicates the importance of tailoring outcome measures to stages in order to assess progress toward stage-specific goals, and also to gather research data that will enable future MTW providers to elaborate on expected program outcomes. While measuring active engagement may not be

beneficial for all children of this age, it is the foundation of all social and communicational learning, and merits further exploration, especially as it pertains to naturalistic, family-centered early interventions. This offering of the More Than Words program appeared to be most effective in increasing active engagement for the children at the own agenda/requester Hanen stages of communication.

Treatment Implications

More Than Words providers may consider grouping families based on Hanen stages of communication. Separate iterations of the program for parents and children with similar goals may promote discourse, observation and exchange of ideas, and the intimate bonding that occurs between parents in the intensive shared experience of small group sessions, as well as facilitate scheduling of peer play opportunities. In this format, small group training sessions could also be augmented with more extensive and advanced discussion and counseling on other issues and parental concerns that are likely shared by those with children at a similar developmental level. A counseling component is also recommended because, as this program is intended to be an early intervention, diagnoses are likely recent, and parents may be experiencing the onset of the grieving cycle. This is the ideal time to discuss positive coping strategies that will most effectively support parent mental health and family relationships and lower parental stress (Hastings et al., 2005).

One of the most common requests coordinators of this particular program received was for more extensive input on how parents could facilitate social skills and peer interactions. Therefore, it is believed that the program may also benefit from inclusion of sibling or peer workshops and in-home coaching to supplement parent training. Having a speech-language pathologist demonstrate ways to enhance play interactions can help siblings and peers gain confidence and feel involved.

Conclusion

In conclusion, the results of this study suggest the importance of examining a child's ability to actively engage when setting goals, and its prioritization as a critical goal if not present. Clinicians wishing to address these deficits should be aware of indirect intervention opportunities in their scope of practice, and the potential of these interventions to facilitate more complete skill learning. Teaching parents of children with ASD strategies to help their children establish and learn to value engagement may be especially relevant for children who use lower rates and less variety of communicative forms and functions.

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BIOGRAPHICAL SKETCH

Jordan Ginsburg was born and raised in Miami, Florida. She graduated from Miami Palmetto Senior High School in 2003. She earned her B.A. in Communication Sciences and Disorders from the University of Florida in 2007, followed by her M.A. in the spring of 2009. As an undergraduate and graduate student at the University of Florida, Jordan was fortunate to work in the laboratories of Lori Altmann, Ph.D., CCC-SLP, Hye-Kyeung Seung, Ph.D., CCC-SLP, and Bonnie W. Johnson, Ph.D., CCC-SLP. She also attained part-time employment at the University of Florida Center for Autism and Related Disabilities (UF-CARD). It is here that Jordan was afforded the opportunity to participate in the development and implementation of their inaugural More Than Words program. Additional graduate student clinical practica at UF-CARD, as well as in the developmental disabilities and craniofacial units of the University of Florida Speech and Hearing Clinic and Shands Rehab for Kids at Magnolia Parke, allowed Jordan to focus on the provision of speech and language services to pediatric populations. Through UF-CARD, Jordan was also able to explore collaborative, interdisciplinary, team-based models of intervention, including parent and teacher training and classroom and home consultation.

Jordan is pursuing a career in clinical speech-language pathology, and hopes to specialize in the population on the autism spectrum.