IMPROVING THE SOCIAL COMMUNCATION COMPETENCE OF AUGMENTATIVE AND ALTERNATIVE COMMUNICAITON USERS

BY

C2010
Sandra Wright

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_____
Jane Wegner
Co-Chairperson

_____
Hugh Catts
Co-Chairperson

_____
Michael Wehmeyer

_____
Debby Daniels

_____
Ed Auer

Date defended: _____

The Dissertation Committee for Sandra Wright certifies that this is the approved version of the following dissertation:

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Committee:

_____
Jane Wegner
Co-Chairperson

_____
Hugh Catts
Co-Chairperson

_____
Michael Wehmeyer

_____
Debby Daniels

_____
Ed Auer

Date approved: _____

Abstract

A repeated measures design was used to investigate the effect of group intervention on the teaching of partner-focused questions to people who use augmentative and alternative communication (AAC), and the perceived communicative competence before and after intervention of the AAC users. Six participants who had severe speech impairments participated in the study. They ranged in age from 18 to 49 years, had a developmental disability with the absence of a social disability, and used a range of AAC systems. The intervention sessions were conducted in a dyad format with two AAC users, and were conducted in one-hour sessions over four consecutive weeks. Four out of the six participants increased the number of partner-focused questions used from pre-intervention to post-intervention. Members of the general public, blind to the goal of this study, judged the majority of the participants to be more communicatively competent after intervention.

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CHAPTER I

Introduction

The ability to communicate allows people to interact with and learn about others. Given the availability of technological support, the inability to produce or difficulty with the production of natural speech should not inhibit a person's ability to communicate with others. The American-Speech-Language-Hearing-Association (2004) noted that all persons identified with a speech-language disorder should be considered as potential candidates for an augmentative and alternative communication (AAC) system. In 2008, the American Speech Language Hearing Association (ASHA) reported that 8 to 12 people per 1,000 were unable to use natural speech and/or written language to meet their daily communication needs and require AAC. AAC is used to compensate, either temporarily or permanently, for reduced communication abilities of people with significant speech-language disorders in both spoken and written forms (ASHA, 2005). Some people use AAC as a supplement to their natural speech, while others use it as their primary method of expressive communication supplemented by gestures, facial expressions, and other forms of nonverbal communication.

A variety of people use AAC systems. People who use AAC come from all age groups, socioeconomic backgrounds, as well as racial and ethnic backgrounds (Beukelman & Mirenda, 2005; ASHA, 2008). People with both congenital and acquired communication disorders use AAC systems. Beukelman and Mirenda (2005) stated that the most common congenital disorders resulting in severe communication disorders are cerebral palsy, intellectual disability, autism spectrum disorder and developmental apraxia of speech. The most common acquired disorders resulting in a severe

communication disorder are amyotrophic lateral sclerosis (ALS), multiple sclerosis (MS), traumatic brain injury (TBI), stroke, and spinal cord injury (Beukelman & Mirenda, 2005). It was reported that hospitals are the clinical setting in which speech pathologists provide the highest percentage of AAC intervention followed by public schools (ASHA, 2005). It is estimated that 4.2 percent of the population worldwide age 85 or older use some type of AAC system (Blackstone, 1990). This number decreases to 0.8 percent of people age 45 to 54 years and even less for the total school-age population worldwide at 0.2 to 0.6 percent. The prevalence as it relates to age helps to explain why hospitals would have the high percentage of AAC users receiving intervention.

Developmental disabilities, those present at birth or acquired before age 22, affect one or more area of development such as cognitive, sensory, or physical (Beukelman & Mirenda, 2005). AAC techniques are often used with people with developmental disabilities to enhance language learning and use. It is estimated that between 550,000 and 764,000 Americans have a diagnosis of cerebral palsy (Workinger, 2005). The prevalence of people with cerebral palsy has continued to increase from year to year despite the advances in obstetrics and medical care. It is estimated that approximately 30 percent of people with a diagnosis of cerebral palsy have impairments in hearing, speech, and/or language (Pellegrino, 2002). Specifically, dysarthria, a motor speech disorder, is estimated to occur in 30 to 80 percent of people with cerebral palsy (Beukelman & Mirenda, 2005). The type and severity of dysarthria can vary greatly, but a multimodal approach to communication can be taught and is available. Therefore, there are many individuals with cerebral palsy who benefit from the use of an AAC system.

The prevalence of people identified as having an intellectual disability who use AAC has been increasing since the mid-1980s (Beukelman & Mirenda, 2005). Prior to this time, a candidacy model was used and it was determined that people with intellectual disabilities did not have the capacity to learn to use an AAC system. Since the mid-1980s, there has been a change in attitude regarding the capabilities of persons with intellectual disabilities as well as a change in attitude by society and professions about AAC. Approximately 1 to 3 percent of the population worldwide has a diagnosis of intellectual disability (World Health Organization, 2001). A study conducted in the state of Washington indicated that people with intellectual disabilities made up the largest percentage of the school-age population who are unable to speak (Matas, Mathy-Laiddo, Beukelman, & Legresley, 1985; Weiss, Seligman-Wine, Lebel, Netta, & Yalon-Chamovitz, 2005). This study concluded that 92 to 100 percent of school children in the state of Washington diagnosed with an intellectual disabilities required extensive support and could potentially use an AAC system. A similar study conducted by Weiss, Seligman-Wine, Lebel, Netta, and Yalon-Chamoz (2005) found that of all the children identified in Israel as qualifying for special education, 75% had a diagnosis of an intellectual disability, with 40% of those having a severe communication disorder.

Another group of people who often benefit from the implementation of an AAC system are people who have a diagnosis of autism spectrum disorder (ASD). There are three established diagnostic features of ASD. First, the person has impaired social interactions. Second, communication skills are impaired. Finally, the person has maladaptive behaviors (American Psychiatric Association, 1994; World Health Organization, 1992). The severity of impairment of any or all of the three identified

diagnostic features varies greatly across people with ASD. Some people will develop verbal communication, others will not. It is estimated that approximately 50 percent of people diagnosed with ASD will never develop verbal speech that meets their communication needs (National Research Council, 2001; Prizant, 1996). AAC systems are often used to help facilitate language acquisition for people diagnosed with ASD. However, incorporating an AAC system into the acquisition of speech and language for children with ASD or any other developmental disabilities can be challenging.

Children with developmental disabilities who use AAC often have more restricted experiences within the environment and atypical interaction with peers (Sutton, Soto, & Blockberger, 2002). When a person uses an AAC system, it is not uncommon to see only vocabulary for the communicative purpose of expressing wants and needs (Beukelman & Mirenda, 2005; Rackensperger, Krezman, McNaughton, Williams, D'Silva, 2005; McCarthy, Light, & McNaughton, 2007; Sutton et al., 2002; Light, 2003; Blockberger & Sutton, 2003). Due to the differences in social experiences and accessible vocabulary, it would be expected that AAC users have difficulty expressing more complex ideas and meeting social expectations. However, some AAC users do become proficient in some communicative interactions that demonstrate the acquisition of social communication skills (Rackensperger et al., 2005). This is in part due to the predictability and frequency with which social phrases such as "Thank You" and "Hello. How are you?" occur with a variety of communication partners and in a variety of social situations.

People develop their communication based on their life experiences (Hart & Risley, 1995). Children who use AAC often do not experience the same predictable and spontaneous situations as their peers who are developing typically (Rackensperger et al.,

2005). The differences in background knowledge and experiences can impact the perception of communicative competence of an AAC user by his or her peers. AAC users have reported that they have difficulties in their living and social environments, feel socially isolated, and experience low expectations from others (McCarthy et al., 2007). The different life experiences and predictable environments may also impact social exchanges with others and the AAC user's knowledge, judgment and skills of available or accessible vocabulary.

AAC User Outcomes

AAC intervention outcomes have been identified as a critical research area by the National Institute on Deafness and Other Communication Disorders (NIDCD) (Lund & Light, 2006). With respect to AAC, outcomes can be defined as changes in a person or their life that can be attributed to AAC intervention (Schlosser, 2003). There have been two primary methods used to determine AAC intervention outcomes: efficacy research and effectiveness research. Efficacy research occurs in ideal intervention conditions, using the most optimal and trained clinicians, optimal participants, treatments with high integrity, optimal structure in which to provide treatment, and optimal measures to indicate change (Schlosser, 2003). In comparison, effectiveness research occurs in average conditions, with average participants, average clinicians, and average treatment methods (Schlosser, 2003). Effectiveness research has been identified as more beneficial because results based on average conditions compared to optimal, are more transferable across environments (Robey & Schultz, 1998). For the AAC users themselves, the most critical aspect of research is the social validity and impact on quality of life (Lund & Light, 2006). Lund & Light (2006) stated that "good" outcomes of intervention for AAC users lead to an increase in the ability to participate in all settings with all people.

There have been three studies conducted for the purpose of evaluating outcomes of AAC intervention (Lund & Light, 2006; Lund & Light, 2007; Lund & Light 2007a). Lund and Light (2006) reported outcomes of AAC intervention by collecting data and information using the International Classification of Functioning, Disability and Health (ICF) from the World Health Organization. Six male participants between the ages of 19 and 23 who had all used AAC participated in the outcome research study. All of the participants had used AAC since preschool and had previously participated in a study by Light, Collier, & Parnes (1985). The researchers collected a wide variety of data, presented in Table 1, for each participant during sessions that varied from 10 to 12 hours over an average of four sessions.

A group average was taken for each area of measurement. The participants' individual scores were then compared to the group average. Since the study was descriptive in nature, no causal statements could be made regarding the outcomes for each participant. Across all areas measured, participant scores demonstrated that interactions with others and life experiences were similar. The participants, on the whole, felt that they did not get the same level of language instruction for the purpose of language development compared to their peers. Language abilities were identified as an inadequate predictor of participation outcomes of an AAC user. The ability to engage in communication situations with others in a variety of contexts, regardless of language abilities, impacts an AAC user's participation abilities. Most AAC users have limited language production practice opportunities (Blockberger & Sutton, 2003). Rather, exploring an AAC user's interaction abilities should be used as a predictor of participation outcomes, therefore good outcomes.

Table 1

Data Collection based on ICF

Assessment	Authors	Area of Measurement
Peabody Picture Vocabulary Test, Revised (PPVT-R)	Dunn & Dunn, 1981	Receptive language
Test of Auditory Comprehension of Language, Revised (TACL-R)	Carrow-Woolfolk, 1985	Receptive language
Gray Silent Reading Test	Widerholt & Blalock, 2000	Reading Comprehension
Functional Assessment of Communication Skills for Adults (ASHA FACS)	Frattali, Thompson, Holland, Wohl, & Ferketic, 1995	Functional Communication
The Arc's Self-Determination Scale	Wehmeyer & Kelchner, 1995	Self-determination
Quality of Life Profile for People with Physical and Sensory Disabilities	Renwick, Brown, & Raphael, 1998	Quality of life
Conversational samples with caregiver, peer, student investigator		Communicative interaction
Semantic/Syntactic analysis of language sample		Linguistic complexity

After analyzing what constitutes a good outcome for AAC users, Lund and Light (2007) determined that the communicative interactions of AAC users should be further explored. Lund and Light (2007) evaluated the communication skills and tendencies during one-to-one communication settings of seven AAC users, between the ages of 19 and 23 years, who had used an AAC system since preschool, at least 15 years. All seven participants had a diagnosis of cerebral palsy, complex communication needs resulting in the inability to meet daily needs using verbal communication, and had participated in a research study examining communicative interactions while in preschool. The

researchers included three communication partners for each participant as well. The communication partners consisted of a care provider, a familiar same-aged peer, and an unfamiliar person. Each dyad was videotaped in a natural environment (home, school, etc.) and the care providers and peers were provided some examples of topics of conversation. Each video recording was at least 30 minutes in length. The researchers then transcribed each video recorded interaction in its entirety being certain to document the nonverbal communication and vocalizations as well. The conversations were coded for four categories: 1) discourse status, 2) communicative function, 3) mode of communication, and 4) linguistic complexity. Discourse status was evaluated on three levels. The first was if a communication turn was taken or if it was a missed opportunity for a turn. The second level was whether the purpose of the turn was to continue the conversation or if it was to co-construct the AAC user's message. The third level was if the communication turn required a response, implied a response, or did not require a response from the partner. Communicative function was coded within several categories. The selected categories were: request for object or action, request for information, request for clarification, request for attention, confirmation or denial, provision of information, provision of clarification, expression of self, imitation or compliance, conversation fill, or incomplete or unintelligible. There were five modes of communication used, AAC system, speech, vocalizations, eye gaze, and gestures. The researchers chose to evaluate linguistic complexity based on the number of concepts and syntactic structure of each utterance. Complete sentences or phrases, programmed on the AAC system, were not included in the analysis of linguistic complexity, as they did not require the participant to construct the utterance. The results yielded a wide range of

interactions between the dyads based on the number of turns taken. AAC users took a mean of 83 communicative turns when engaged with their care provider, a mean of 57 communicative turns with the unfamiliar partner, and a mean of 109 communicative turns with their peers. When the participants were preschoolers, the caregivers took almost twice as many turns as the AAC users. As adults the participants continued to take fewer turns than their speaking partners, an average of 43% of turns with care providers, an average of 42% of turns with unfamiliar partners, and an average of 45% of turns with familiar peers. The researchers also found that, as adults, the participants increased their overall rate of turn fulfillment from 48% as preschoolers to 77%. In regard to communicative function, the participants' turns were confirmations, or provisions of information both as preschool children and adults. The researchers also found that the participants rarely requested information from their caregivers, unfamiliar partners, or peers. They noted that the participants demonstrated the ability to request information in at least one of their video recorded interactions, but did not do so frequently. These results combined with results of the study conducted analyzing good outcomes indicate that AAC users may have difficulty fully participating in conversations using topic elaborations or partner-focused questions. The conversation style of AAC users can be influenced by a variety of factors.

Lund and Light (2007a) conducted interviews with the same seven participants of their conversation style study and a primary care provider to determine what contributing factors were present for AAC users that helped achieve or detract from positive outcomes. Interviews were conducted using a semi-structured, open-ended format. Topics that were discussed included nature of communication interventions and service

delivery, satisfaction with interventions and service delivery, and factors that each participant stated as contributing to his communicative abilities. Results of the transcribed interviews indicated there were two main themes, barriers to positive outcomes and supports to positive outcomes. The participants and care providers identified four types of barriers to positive outcomes. The first type of barrier identified was attitude barrier. Participants reported that professionals often had negative attitudes toward AAC and the participant. Attitude barriers are negative feelings, opinions, or beliefs held by any individual, family, friend, AAC user themselves, etc., that inhibit participation (Beukelman & Mirenda, 2005). Participants also noted they had difficulty making friends due to the attitude of their peers about AAC. Two of the participants and care providers stated cultural differences as a barrier to positive outcomes. These families felt that it was difficult to have an AAC system that allowed for access to only one language, English. For both of these participants, a language other than English was spoken in the home. One participant lived in a bilingual community and was unable to communicate with many people within that environment with his AAC system. The care providers expressed that the speech-language pathologists did not demonstrate empathy or understanding of the bilingual situation and need of the AAC user to participate in the bilingual community setting. The third type of barrier identified was the technological barrier. The AAC users expressed frustration with the slow rate of communication using the AAC system. The care providers and AAC users also felt that the technology was not always reliable due to frequent breakdowns of the different AAC systems. The final identified barrier was that of service delivery limitations. This particular barrier was most commonly and frequently discussed. Participants and care providers indicated

frustration with lack of services available in regard to geographic location and lack of services for adults. Concerns were also expressed regarding the lack of knowledge and expertise by local professionals, and a very limited amount of collaboration among professions to meet the needs of the AAC users. Finally, participants and care providers felt that intervention often targeted the technology itself rather than focusing on overall communication abilities.

Despite the barriers identified by the participants and their care providers, some supports were identified as being key in achieving positive outcomes. One support was that of social support. AAC users received encouragement and advocacy provided by family, friends, and other community members. A specific social support that was identified was family involvement in interventions for the AAC user. A second identified support was the personal characteristics of the participants. Some of the characteristics identified as supporting positive outcomes were patience, hard work and determination, high expectations, intelligence, and sociability. The final support was the services received by the participants. The participants and their care providers stated that having competent and knowledgeable professionals provide intervention for the AAC user, training provided for the families and teachers, and collaboration among all professionals, family and school greatly impacted positive outcomes.

As demonstrated by the effective outcome studies by Lund and Light, AAC users have a desire to communicate with a variety of communication partners within their community (Lund & Light, 2006; Lund & Light, 2007; Lund & Light, 2007a). Adults who use AAC should have the opportunity to engage in leisure activities including having conversations and interactions with others. Research has shown that during

adolescent leisure activities, the desire to interact with peers increases, as well as the number of conversations with peers (Smith, 2005; Datillo, Estrella, Light, McNaughton, & Seabury, 2008).

Datillo et al. (2008) recruited members of the Augmentative Communication On-Line Users Group (ACOLUG) who had a diagnosis of cerebral palsy, used AAC, had literacy skills so that spelling and writing skills could be used to produce functional email messages, had computer and Internet access, and who were involved in leisure or community recreation to participate in their study. A total of eight adults between the ages of 27 and 44 participated in the study that involved responding to topics posted within a discussion thread on an Internet website. Results indicated that AAC users engage in a variety of individual and group leisure activities, with the most popular being watching television or renting movies, listening to music, shopping for fun, and going out to dinner. The participants noted several benefits in being involved in leisure activities. They were 1) improved physical health, 2) enjoyment, 3) improved mental health, 4) increased independence, 5) enhanced networks, and 6) education of society. The participants identified several barriers to leisure activities. Some of the barriers included personal, social, communication, technology, and financial barriers. Positive outcomes for AAC users cannot be discussed without addressing barriers that hinder or detract from achieving them. When engaged in conversations with others in a social environment, AAC users must learn to implement a variety of communication modes and functions to overcome the social barrier (Rackensperger et al., 2005; Light, 1997).

Results of outcome research studies indicate that AAC users have a desire to build social relationships and be active communication partners in a variety of environments.

Researchers and AAC users themselves have identified barriers to achieving the desired level of social equity as verbal communicators (Schlosser, 2003; Lund & Light, 2006; Lund & Light, 2007; Lund & Light, 2007a; Rackensperger et al., 2005; Light, 1997). Attitude barriers were mentioned as an obstacle to obtaining positive outcomes. The attitude of care providers and peers within society who have limited knowledge of AAC can hinder the confidence of the AAC user's communication. It is important that the AAC user and people within society perceive the AAC user as having communicative competence. An AAC user's demonstration and perceived communicative competence could help decrease the amount of asymmetry of turns when in conversation with a verbal communicator.

Communicative Asymmetry

AAC users typically take on passive roles during communication interactions with others (Binger & Light, 2008; Sutton et al., 2002; Bruno & Trembath, 2006; Lund & Light, 2007; Muller & Soto, 2002; Batorowicz, McDougall, & Shepard, 2006). The AAC user often takes on the role of responder instead of initiator due to his or her decreased rate of communication, decreased knowledge of how to begin a conversation, and different life experiences which leads to different background knowledge (Datillo et al., 2008; Lund & Light, 2008). AAC users may not have been provided the opportunity to experience a variety of conversational situations with different communication partners (Light et al., 2003).

Engagements, interactions, and communication roles between people can be influenced by many factors. There are five sets of variables that can influence the interactions of AAC users (Calculator, 1999). The first variable is the available features

of the particular AAC system being used. Some of the variable system features include: the type of display (static or dynamic), number of accessible vocabulary, and ability to adjust the volume of output. A second variable affecting interaction is the characteristics of the person using the AAC system. It is important to consider the AAC user's personality (outgoing versus shy), attitude (upbeat or pessimistic), motivation, and abilities. Not only are the characteristics of the AAC user a variable, but also the characteristics of the communication partner, the third variable. The partner's attitude about AAC, perception of the person using AAC, knowledge of AAC, style of interaction, motivation to interact with the AAC user, and his or her experience and familiarity with AAC are all integral factors contributing to the communicative roles in an interaction. A fourth variable set is the quality and content of the instruction given to both the AAC user and the communication partner. The fifth identified variable that influences interactions is the presence of opportunities and reasons to communication (Calculator, 1999). However, the communicative role that each partner takes during an interaction is not the sole responsibility of the AAC user. People who use AAC develop the ability to respond to a conversation partner but have difficulty with extending or expanding upon the conversation (Lund & Light, 2007). Speaking partners tend to engage in conversations with AAC users in unique ways. The speaking partner may interpret meaning jointly with the AAC user, as well as use a variety of modes of communication such as gestures, speech, and facial expression (Blackstone, Williams, & Wilkins, 2007).

Receptive Language Development

AAC users often develop receptive language skills using multimodal language input through models and language used by family members and other people within

their environment (Beukelman & Mirenda, 2005). However, AAC users receive limited input using their specific mode of communication or AAC system (Sutton et al., 2002; Binger & Light, 2008). Sutton et al. (2002) in a review of literature on grammatical issues related to AAC use, reported many challenges that children using AAC face in learning language. They stated that children learn grammar of the spoken language around them by observing and interacting with competent communicators. Children with severe communication impairments who rely solely on the observation and interactions of competent communicators for language learning have very limited language. Language comprehension, opposed to language production, may occupy a more prominent role in the language acquisition process for AAC users than for non-AAC users.

Binger and Light (2008) reviewed research targeting the morphology and syntax of AAC users. They included research that was 1) published in peer-reviewed journals, dissertations, or book chapters between 1985 and 2006, 2) studies that included morphology and/or syntax data, and 3) studies that included participants with congenital severe speech or physical impairments or who did not have a disability but used AAC for research purposes. They found that based on global measures of receptive grammar, people with severe speech and physical impairments who used AAC typically scored within the average range for their age.

Expressive Language Development

People who use AAC due to a developmental disability face many challenges while developing expressive language skills. When learning to use an AAC system that is based on iconic graphic representations, children will predominantly generate one-word

or one-hit utterances with the system (Beukelman & Mirenda, 2005; Binger & Light, 2008). The use of one-hit or single-word utterances may be the result of the available vocabulary or phrases within the AAC system. It could also be attributed to the selection and competence of interventionists and family members who choose the vocabulary and grammaticality for the emerging AAC user (Sutton et al., 2002). Another reason for the use one-hit or single-word utterances could be the trend of speaking partners to co-construct messages with AAC users after just a word or phrase is provided to increase the rate of communication (Blockberger & Sutton, 2003; Binger & Light, 2008).

When language is learned, people combine symbols in unique ways to express perceptions, thoughts and experiences with others through spoken or written communication (Beukelman & Mirenda, 2005; Iacono, 2003). The experiences that provide opportunities to practice newly acquired language skills vary for AAC users. Children who use AAC learn new words through similar processes as children who develop verbal language (Beukelman & Mirenda, 2005; Nelson, 1992). However, children who use AAC are often delayed in vocabulary acquisition and do not develop as large a vocabulary as their verbal peers (Light et al., 2003; Nelson, 1992; Beukelman et al., 1991). There are several possible reasons why AAC users do not develop similar vocabulary skills as their peers. One reason might be that they are unable to select their own word choices for their AAC system, and must rely on someone else (Blockberger & Sutton, 2003; Light et al., 2003). A second reason for reduced vocabulary development may be the presence of an asymmetry between language input and output (Lund & Light, 2007). People who use AAC systems with graphic symbol representations will express

themselves using graphic symbols, but will not receive feedback from the communication partner in the form of a graphic symbol.

Romski, Sevcik, Robinson, Mervis, and Bertrand (1995) studied the word learning of 12 school age children who had experience with the system for augmenting language (SAL) for a minimum of five years. The SAL was adapted from research with great apes (Rumbaugh, 1977) and consists of (a) an AAC system, (b) visual-graphic symbols that are individually chosen, (c) use in a variety of settings that occur frequently (home, school, etc.) that encourage but do not require the child to communicate, (d) communication partner modeling use of symbols, and (e) a resource and monitoring system (Romski, Sevcik, Cheslock, & Barton, 2006). SAL was developed and designed to supplement natural, although limited, language abilities and facilitate the ability to communicate in a conventional manner in a variety of environments. All of the 12 participants were male, had little to no functional speech, and a diagnosed intellectual disability. Baseline measures reported that the participants had a mean of 66 lexigram vocabulary items in their working vocabulary. The researchers created four sets of stimuli for each individual participant. The stimuli consisted of four known lexigrams and one novel lexigram that had no meaning. Each participant underwent one exposure condition and three assessment conditions. During the exposure condition, the participants were to show fast mapping skills by learning words with the use of the SAL. The participants then engaged in the assessment conditions. The assessment condition was used to determine each participant's comprehension and production of the symbols representing novel objects. Results found that seven of the 12 participants were able to fast map the meanings of two or more novel words to symbol pairings. These results

indicate that some AAC users are able to learn vocabulary even after limited exposure despite the presence of moderate to severe cognitive impairments. It is often care providers, teachers, or family members who select vocabulary to be displayed on the AAC system. Therefore, AAC users often rely on care providers for vocabulary selection, which could inhibit the acquisition of question words due to the frequency of directive statements. Care providers, teachers, and family members will often select vocabulary that is responsive to questions that might be asked as well as vocabulary that will meet immediate needs (Beukelman & Mirenda, 2005). Therefore, AAC users often acquire a high number of nouns and words to meet needs such as "help" or "more" which are easily located on the AAC system (Iacono, 2003; Landry et al., 1994; Mahoney et al., 1990; Roach et al., 1998).

A variety of factors that can influence a child's ability to acquire language through augmented means have been suggested by Romski, Sevcik, and Adamson (1997). Both intrinsic factors, those that the child brings to the ability to acquire language, and extrinsic factors, those that compose or shape the language-learning environment, were suggested. The intrinsic factors consisted of biological and psychological foundations. Biological factors that should be specifically accounted for in the language learning process include: 1) general neurological/neuromotor status, 2) timing of the introduction to augmented language experience compared to age, and 3) what history and background experiences the AAC users bring to the challenge of language learning. In addition to the biological factors, the psychological abilities each child brings to the language learning process should be considered. A child's capacity for speech comprehension can be influenced by two factors: 1) ability to establish correspondence relationships (object to

symbol/word) and 2) ability to transfer the information across modes. If children who use augmented communication have little to no speech comprehension, they have a less stable foundation of word understanding to link new visual symbols to their referents. Two extrinsic factors were also identified: 1) modalities and devices and 2) instructional approaches. For children who have severe speech impairments resulting in the need for augmented speech, the most important consideration is the modality and technology that will be used. If vision is not impaired, speech is frequently augmented through the use of the visual modality, which includes unaided (sign language, gestures, etc.) and aided (icon-based system, computer-based device, etc.) forms of communication. Instruction has often occurred under controlled conditions to target a specific skill when teaching one to use augmented communication. However, since the late 1980s there has been a shift to integrate instructional approaches into naturally occurring contexts. This shift has been the result of the increased interest in the social use of language in context.

Communicative Functions

At any point in language development, people have the ability to understand more words than are used for expression (Blockberger & Sutton, 2003; Nelson, 1992; Benedict, 1979). AAC users tend to use and learn words easier when they are more concrete and have physical referents with which to associate the word (Nelson, 1992). When a physical limitation is present, AAC users may face even greater challenges in learning expressive language. Children with physical limitations can have limited opportunities and abilities to explore their environments and engage in interactions with others. Nelson (1992) described the risk that AAC users with physical limitations face in accessing multiple environments where there would be exposure to rich receptive

vocabulary and a variety of communication partners. Therefore, AAC users may not have adequate knowledge and experience with a variety of communicative functions.

Light, Collier, and Parnes (1985) evaluated the interactions and communicative functions of eight children between the ages of four and six years. They explored the different communicative functions used by the children in two contexts, one was free play with the primary care provider, and the second was free play with a clinician. All eight children were boys who were nonverbal and also had physical disabilities. Seven of the boys had a diagnosis of cerebral palsy, while the eighth boy was diagnosed with Lesch-Nyhan Syndrome. The participants had normal vision, hearing, and receptive language. Each participant had been using an AAC system for least nine months. On each AAC system, the participants had at least 100 symbols and/or pictures including questions, social amenities, people, actions, objects, and places. Each participant was videotaped on two separate occasions during free play. In the session with the primary care provider, toys were provided and the care providers were instructed to play, talk with the child, and interact as they would in their own home environment. After the session with the care provider, each care provider confirmed that the play session was similar to what would occur in the child's home environment. Each video recorded session was transcribed in its entirety and each communicative turn was separated. A communicative turn was defined as indicating intentional behavior directed toward the communication partner. The researchers found that during interactions with the primary care provider, the AAC user tended to have one function per communicative turn, while the care provider averaged three or more functions per communicative turn. The children demonstrated a limited range of communicative functions. None of the children requested

information from the care provider. Out of the eight children, only one expressed any greetings, closing, or other social conventions throughout the free play. It was determined that almost 10% of the children's communicative turns were unintelligible to both the researchers and the care providers. The children's primary communicative function with the care provider was to provide confirmation, denials, or give information. Similar communicative functions or lack thereof were observed in the children during free play with the clinician. This research also demonstrated that parents of children with significant communication impairments and physical limitations engage in question-answer dialogue with their children, where the answer is already known or constrained by context. For example, in a free play situation, the care provider would hold up a toy and ask the child "What's this?" and instead of waiting for the child to respond, or demonstrating how to find the dive on the AAC system, the care provider would answer, "It's a doll."

AAC communication is often judged to be telegraphic in nature (Blockberger & Sutton, 2003). The use of telegraphic messages relies heavily on the communication partner having similar experiences and background knowledge about the AAC user. If the AAC user wishes to engage in communication with an unfamiliar partner, there are often many communication breakdowns and failures (Blockberger & Sutton, 2003). At times, AAC users are unaware of the breakdowns or do not have the abilities to repair the conversation because the development of social competence is absent or delayed in development. Therefore, others may not perceive the AAC user as having communicative competence.

Communicative Competence

According to Light (1988), there are four primary purposes for which people communicate: 1) communication of wants and needs, 2) passing along information to others, 3) developing social closeness with others, and 4) applying social etiquette. Communication is social in nature in that it involves at least one reciprocal partner. People are more likely to engage with communication partners who are perceived as having communicative competence. Developing communicative competence is as important for people who use AAC as those who communicate verbally (Light, 2003). Communicative competence is needed so that people can realize their right to share and discuss personal, education, vocational, and social goals and to achieve their full potential (Light, 2003).

Domains

Communicative competence is defined as having the ability and strategies to effectively communicate ones' thoughts, ideas, and opinions to another. People who use AAC are considered to have communicative competence if they have knowledge, judgment and skills in four domains: 1) linguistic, 2) operational, 3) social, and 4) strategic (Light, 1989). Linguistic and operational competence relate to how well the AAC user is able to use his or her AAC system and demonstrate linguistic knowledge, whereas social and strategic competence refer to function and judgment of communicative interactions (Light, 1989). Each of the four components reflects many different skills and ways in which competence for that particular domain can be demonstrated.

Linguistic competence. Linguistic competence is essential to the development of communicative competence. Light (1989) defined linguistic competence a person's ability to master the linguistic code. It is possible to establish communication with others without words, such as the use of eye gaze, or vocalizations; however, these forms of communication are very limited in nature (Light, 2003). It would be very difficult for people to share information with others or express wants and needs without the presence of at least minimal linguistic competence. Linguistic competence for AAC users requires that they understand the native language as spoken by those in the community, as well as the code needed for the AAC system (Light, 1989). Therefore, the AAC user will be learning and decoding two sets of linguistic codes simultaneously. It can be challenging for the AAC user to master the code of the AAC system as she or he often has limited models of proficient use of AAC within the community or home (Light, Collier, & Parnes, 1985; Light, 1989). AAC users learn to manipulate their linguistic code to generate questions, make comments, and express opinions within the linguistic area of grammar.

Grammar can be separated into several different components (Fey, 2008). One's level of knowledge of grammar may vary depending on the identified component (Fey, 2008). Some of the smaller components of grammar are articles, tense markers, and auxiliary verbs. Grammar can also be analyzed in terms of larger components such as morphology, the components of words, and syntax, the way in which words are strung together for meaning. The knowledge and skills related to the larger components of grammar, such as syntax, allow people to use their vocabulary knowledge for different functions. Although changes in intonation can be utilized with one-word utterances to

indicate different meanings or intent, one-word utterances alone do not provide insight into a person's syntax understanding and knowledge. Syntax knowledge, use, and understanding often begin developing when children have acquired around 50 different vocabulary words. This development stage of producing two-word combinations begins to appear around two years of age (Brown, 1973). The combination of words allows children to be more expressive and explicit in their language production and meaning. Many AAC interventions focus on increasing the number of words used within an AAC system to increase overall length of utterance production (Blockberger & Sutton, 2003). It is during the early word combination phase that children begin to ask for more of something, refuse or say no to something, and indicate recognition of something (Gleason, 1993). An AAC user's ability to demonstrate the flexibility of word use, syntax and other grammatical features impacts how others perceive his or her linguistic competence. Linguistic competence allows AAC users to understand and use their systems to communicate ideas, thoughts, and feelings, whereas operational competence is needed to access and operate their chosen AAC system.

Operational competence. To achieve operational competence, AAC users must demonstrate the knowledge, judgment and skills needed to produce the hand shapes, orientations and movements of a manual system, or the technical skills to operate a speech-generating device (Light, 2003; Light, 1989). Some of the ways operational competence is demonstrated are to adjust the volume, operate access techniques (direct selection, single-switch access, etc.), turn the systems on and off, and program or edit the vocabulary within the system. Operational competence can be observed when an AAC user is able to focus on the message rather than the process of message production

(Treviranus & Roberts, 2003). Operational competence has largely been related to motor demands and abilities of the AAC user (Light, 1989). Motor abilities can be influenced by a variety of factors such as, emotional state, level of arousal, comfort, motivation or attitude toward a task, and/or understanding the task (Treviranus & Roberts, 2003). The acquisition of operational competence impacts the effectiveness of communication, efficiency of communication, and does not cause the AAC user fatigue (Light, 2003). While linguistic and operational competence ensure that the AAC user has the ability to communicate, social competence is needed to ensure that the AAC user knows when and how to communicate with others (Light, 2003).

Social competence. The social domain of communicative competence can be divided into two subcategories, sociolinguistic and sociorelational skills. Sociolinguistic skills are commonly referred to as pragmatic skills. Some of the skills within this subcategory include the ability to take turns, initiate appropriate topics, and stay engaged in a cohesive conversation (Light, 2003; Light, 1989). All of the skills related to sociolinguistics are context dependent (Light, 1989). The AAC user must be able to engage in an effective and appropriate manner with his or her communication partner, thereby demonstrating sociolinguistic skills.

The second component of the social domain is sociorelational skills. Sociorelational skills are critical for an individual to engage and participate in daily interactions with others (Light, 1989). Sociorelational skills include maintaining a positive self-image, an interest in others, desire to communicate with others, active participation in conversations, responsiveness to partners, and the ability to put a communication partner at ease (Light, 1989; Light, 2003). It is important that AAC users

have the opportunity to practice effective sociorelational skills and learn from mistakes to aid in the development of adequate sociorelational skills. Through practice, AAC users can not only improve their social communicative competence, but can also learn strategies of effective communication.

Strategic competence. The strategic domain of communicative competence is the ability to adapt communication skills to compensate for 1) limitations of linguistic, cognitive, motor, sensory or perceptual abilities; or for 2) limitations present due to external factors (partner attitudes, vocabulary present on AAC system, etc.) (Light, 1989; Mirenda & Bopp, 2003). When AAC users learn an effective strategy to compensate for limitations in any given area, they will often use this strategy consistently over time (Light, 1989). The development of strategic competence is influenced by a number of different variables. Some factors include a person's metacognitive skills, personality, and cultural background (Mirenda & Bopp, 2003). The most common compensatory strategies used by AAC users are the use of predictive and telegraphic communication (Light, 1989). These strategies are often used to override operational competence limitations, such as the presence of limited or inadequate vocabulary. Strategic competence is important when AAC users are faced with novel situations involving unique or unexpected linguistic, operational, and interpersonal demands (Light, 1989).

Although the four domains of communicative competence can be parsed apart and discussed individually, it is the integration of the knowledge, judgment and skills in all domains that is of greatest importance. Therefore, the AAC user must be able to integrate his or her knowledge of the four domains to demonstrate communicative competence (Light, 1989). Some AAC users, however, may need intervention to focus

on a particular domain or combination of skills across domains. Each of the domains can be taught separately, however, the development of an isolated skill is not functional for any individual. It is possible that an AAC user has linguistic competence and operational competence, but limited social understanding, and therefore will have potentially limited or restricted opportunities to interact with others (Light, 1989). Understanding when and how to use language is important in gaining information from others for the purposes of information transfer or developing social closeness with others. One way to do this is through the use of partner-focused questions.

Partner-Focused Questions

AAC users must have some knowledge and skill in both sociolinguistic and sociorelational components of the social domain of communicative competence when asking partner-focused questions. Questions are used as a form of social communication in order to interact with different communication partners. People ask questions when information is desired about the surroundings, events in the past, present, or future, to understand actions and reactions, and to gain information (Wiig, 1989). The use of questions plays a critical role in demonstrating the ability to be "other-oriented". People who are considered to be competent communicators are "other-oriented" rather than "self-focused" in adulthood (Light, Arnold & Clark, 2003). AAC interventions often focus solely on information related specifically to the AAC user's interests, hobbies, wants, needs, etc. (Light, 1989). The component of social competence, specifically in regard to sociorelational skills and "other-orientation", has been largely ignored during intervention for people who use AAC systems (Light et al., 2003; Light, 1989).

Conversational interactions between an AAC user and a speaking partner most frequently follow a question and answer format, with the AAC user being the responder (Lund & Light, 2007). AAC users, when taught to use questions, primarily use them as an initial request whether for a specific item or engagement in interaction rather than as a means to extend and expand on an ongoing conversation (Iacono, 2003). The social component in language is linked to the linguistic component in that people must be able to recognize and resolve breakdowns in communication (Iacono, 2003). Therefore, it is important that both linguistic and sociorelational skills be taught to AAC users to improve overall communicative competence.

Teaching Social Communication Competence

Sociolinguistics, or pragmatics, consists of prelinguistic or linguistic skills, as well as using the language knowledge to serve communication goals when engaging in interactions others (Iacono, 2003; McTear & Conti-Ramsden, 1992). Just as joint attention provides parents opportunities to provide language input, it also serves as the first models of partner-focused interactions. Children who use AAC demonstrate reduced joint attention (Blockberger & Sutton, 2003). This could be due to the need of shifting focus from the referent to the communication system then to the care provider and then back to the referent. The more communicative signals a child can give a parent, the better the parent's ability to respond to early initiation attempts (Wetherby, Yonclass, & Bryan, 1989; Nelson, 1992; Iacono, 2003). The role of care providers response and reaction to infants and young children's attempts at communication is crucial in the development of social skills, both sociolinguistic and sociorelational skills.

Sociolinguistic Skills

Social interactions between young children and care providers are typically the care provider responding to precommunicative signals from the child, such as vocalizations and attempts at imitating facial expressions (Yoder, Warren, McCathern, & Leew, 1998). Parents or care providers of young children who have significant communication disabilities may be unaware of the child's attempts to exhibit precommunicative signals that indicate environmental awareness (Iacono, 2003). The lack of response of care providers can cause children who have significant communication disabilities to fail to develop contingency awareness. Contingency awareness is the understanding of the relationship between one's behaviors and their impact on the environment (Iacono, 2003; Schweigert, 1989; Watson, 1966). If initial communication attempts are not responded to, a possible outcome is that the child loses motivation and desire to interact with people or objects within the environment. Schweigert (1989) conducted a single-subject design investigation to increase awareness of social contingencies of a child with severe vision, hearing and orthopedic impairments. The participant of the study was seven years old. She had hydrocephalus, spastic quadriplegia, an uncontrolled seizure disorder, an intellectual disability, and a congenital absence of the radius of her right arm. Prior to the study, intervention targeted responding to auditory or visual stimuli. She had extremely limiting motor and sensory impairments that impacted her ability to interact with her environment. This case study compared the effectiveness of social and nonsocial stimuli when the participant activated a microswitch. Nonsocial stimuli were determined based on preferences of the participant as reported by people who interacted with her regularly (care providers,

teachers, therapists, etc.). The nonsocial contingency trials involved the integration of auditory or tactile stimuli. The social contingency trials involved social feedback delivered by the participant's primary care provider who would stand directly in front of the participant at eye level. Regardless of the contingency type, when the participant activated the microswitch, a vibrating device attached to the underside of her wheelchair would be activated with a voice cue. Results yielded a significant increase in the number of activations when social contingency was used. During nonsocial tasks the average number of switch activations was 1.7, whereas during social tasks the average was closer to 7.5, per 10 minutes. This research reported that the participant was aware and understood the difference between the interaction with her care provider and nonsocial stimuli. This is just one example of the importance of social interaction and response to communication attempts by people with significant communication disorders.

There are three social interaction skills that develop once children are able to produce multiple word utterances. The first skill is calling for the attention of another. Secondly, children begin to request information. Finally, children will acknowledge statements or actions made by others within the environment (Iacono, 2003). It would not be possible to demonstrate these skills unless there is a responsive communication partner and a means to do so. For children who use AAC, the expansion of their linguistic abilities is partly influenced by the AAC system they use and its capabilities to produce utterances related to these three social interaction skills (Iacono, 2003).

Udwin and Yule (1991) studied the use of different AAC intervention models to improve social skills of AAC users. They found that analyzing gestures, vocalizations, eye-gaze, and facial expressions provide good insight to a child's functional

communication abilities. They also found that interventions that used a semi-structured approach to interactions provided opportunities to teach some social skills such as, turn taking, but not other communicative functions such as expansion or elaboration. Children's lack of progress in language development correlates with lack of progress in the development of social skills (Udwin & Yule, 1990; Udwin & Yule, 1991; Iacono, 2003).

Sociorelational Skills

It is important that people who use AAC develop and understand the interpersonal aspects of communication. Sociorelational, or interpersonal, aspects of communication include skills such as, demonstrating an interest in others, putting communication partners at ease, showing responsiveness to the communication partner, and developing positive relationships (Light, Arnold, & Clark, 2003; Light, 1989). Sociorelational skills are essential in the development of social closeness. Developing and maintaining relationships with others is often a high priority for people (Light, 1988; Diamanti, 2000). As a result of absent or underdeveloped sociorelational skills, people with disabilities often have fewer friends and limited social networks (Light et al., 2003). Therefore, it is important that AAC users receive intervention focusing on the development of sociorelational abilities.

AAC users are able to meet the communication functions of expressing wants and needs, as well as share and exchange information with others; however, the sociorelational skills needed to build relationships with others is often lacking (Light et al., 2003). One factor to consider in the sociorelational skills of AAC users is that all persons within the interaction must have similar skills, as the conversation is interactive

and constantly transitioning topics or speakers. Therefore, a person's interactions are often influenced by the communication and interactions of the other people engaged in conversation (Light et al., 2003). The instruction and development of sociorelational skills of AAC users is influenced by three factors. First, AAC users often do not have a positive self-image, do not demonstrate an interest in others, do not put their communication partners at ease, do not demonstrate a desire to communicate, do not take the role of an active participant in conversation, and do not show responsiveness to their communication partner(s), all of which inhibit their development of sociorelational skills (Light, 1989). The second factor is the determination of what specific sociorelational skills should be targeted during intervention for AAC users. Finally, there is the influence of the chosen intervention strategies and techniques used when teaching AAC users absent or underdeveloped sociorelational skills (Light et al., 2003). Overall, it can be difficult to determine an AAC user's current sociorelational knowledge, judgment, and abilities.

AAC users often have different background knowledge and environment exposure compared to their peers who develop typically (Rackensberger et al., 2005). Many AAC users find themselves socially isolated and have very limited opportunities to build sociorelational skills with a variety of communication partners (Light et al., 2003). Therefore, AAC users may not have the opportunity or means to learn and/or demonstrate sociorelational skills. AAC users who also have significant motor impairments may not be able to use, or may be misunderstood when using, nonlinguistic methods such as facial expressions, eye gaze or vocalizations to demonstrate interest in their communication partners (Light et al., 2003; Nelson, 1992). The inability to produce these nonlinguistic

methods of communication interactions may be interpreted as lack of sociorelational skills and disinterest by the communication partner. Nelson (1992) suggested that language performance is what a person really knows about language, and that what a person knows about language may vary based on context. AAC users may have limited opportunity to learn, or have access to, vocabulary needed to participate in interactions that demonstrate sociorelational skills, such as the use of partner-focused questions (Light et al., 2003; Beukelman, McGinnis, & Morrow, 1991; Light, Binger, Agate, & Ramsay, 1999).

Perceptions of Communicative Competence

Analyses of conversations between AAC users and verbal communicators have yielded many results and characteristics of the AAC users' communicative abilities and therefore, perceived communicative competence. Findings have shown that AAC users are passive communicators when engaged with speaking communication partners (Schlosser, 2003; Lund & Light, 2006; Lund & Light, 2007; Lund & Light, 2007a; Rackensperger et al., 2005; Light, 1997). A large number of communication breakdowns occur when AAC users engage in conversations with verbal communicators, leaving the verbal communicator to implement repair strategies (Calculator & Delaney, 1986; Yoder & Kraat, 1983). The communication characteristics of AAC users when engaged in conversation with a verbal communicator have been explained using a number of different factors (Hoag, Bedrosian, Johnson, & Molineaux, 1994). The first factor is that AAC users have a slower rate of message generation and transmission compared to natural speech. A second factor is that at times the AAC system is difficult for the speaking partner to understand. A third factor is that the AAC user generates a message

that is inefficient or ineffective. The length of the messages created by the AAC user is another factor. Finally, the behavior of the speaking partner during the conversation could influence the communicative abilities of the AAC user. Information regarding the perceived communicative competence of AAC users by verbal communicators is important when developing intervention goals for AAC users.

Bedrosian, Hoag, Calculator, and Molineux (1992) examined the effects of message length by the AAC user, partner reauditorization, and observer background on the perceived communicative competence of an adult AAC user. The researchers had two groups of participants. The first group of participants included people who (a) had no educational training or professional experiences with AAC, (b) had limited or no experience seeing or interacting with individuals with complex communication needs, and (c) possessed normal hearing and vision. This group of participants ranged in age from 22 to 65 years, nine of whom were men and 15 of whom were women. They were all typically developing verbal communicators. The second group of participants included 24 speech-language pathologists who (a) had two or more years of paid professional experience working with AAC users, (b) had a caseload of at least two AAC users at the time of the study, (c) held a state license in speech-language pathology, and (d) possessed normal hearing and vision. The group contained four men and 20 women with an age range of 24 to 47 years. There were four components to the development of the experimental procedure. First, the researchers had to construct conversational scripts, prepare a videotaped recording of the conversation between two actors, one of whom used AAC, develop a questionnaire, and select an experimental design. The conversational scripts were created to vary the message length of the AAC user and the

partner reauditorization by the verbal communicator. Two levels of message length were used, the single-word level and the phrase-level involving two to four lexical items per message. At both levels of message length, lexical items consisted of content words, while excluding bound morphemes and the verb forms "to" and "be". Partner reauditorization was defined as utterances by the verbal communicator that expanded or elaborated on the AAC user's message without rising intonation. The conversational script contained situations in which partner reauditorization was present and absent. A total of four conditions were created, based on the use of single-word or phrase length utterances and the presence or absence of partner reauditorization. The same pair of conversation partners read each of the four scripts. One partner was an actor portraying the role of an adult male who had a diagnosis of cerebral palsy without a cognitive impairment; the other partner was a typically developing verbal adult peer. Each of the conversational scripts was videotaped. Actors played the roles of the conversation partners during all four conversational scripts. The actor who portrayed the AAC user with a diagnosis of cerebral palsy received extensive coaching regarding vocalizations, gestures, as well as, hand, torso, and head posture characteristics of people with cerebral palsy. Once the video recordings were completed, they were viewed by people with cerebral palsy to determine validity of communication tendencies by the actor who portrayed the role of an AAC user with cerebral palsy. The research team developed a questionnaire specifically for this investigation that was based on terminology and literature related to effective AAC use. The questionnaire used by the two groups of participants consisted of 30 items related to the communicative competence of the AAC user in the videotaped recordings. The participants rated each statement using a 5-point

Likert scale (1=definitely false, 5= definitely true). Results showed that participants in the first group specified no difference in regard to communicative competence based on message length (word versus phrase) of the AAC user. However, the second group of participants (speech-language pathologists) reported that the AAC user demonstrated more communicative competence when phrases were used compared to single-word messages. Neither group of participants noted any difference in the demonstration of communicative competence when partner reauditorization was used. The difference in perceived communicative competence based on message length might be attributed to expectation of the observer and background knowledge related to typical language patterns of AAC users. Researchers noted that many of the participants in the first group made comments regarding their positive impression of the person with cerebral palsy to be a responsive communication partner at all. However, it was not noted if the AAC user was deemed to be "other oriented" during the dialogue, or if the AAC user used partner-focused questions to gain information from his communication partner.

Question Use

The use of partner-focused questions is one way to begin an interaction between two conversation partners (e.g., "Hi! How are you?). However, there are many variables that impact the interaction between communication partners. Blackstone et al. (2007) noted the most common variables in communicative interactions are: (1) physical and cognitive characteristics of the partners, (2) how the messages are being conveyed and represented (face-to-face, internet, letter, etc.), (3) environment in which the interaction is occurring (noisy, dim lit, school, home, etc.), (4) social relationship of the communication partners, and (5) specific purpose for the interaction. Interactions

between communication partners occur in turn-taking sequences. As children develop their language skills, caregivers will provide opportunities for the child to participate in a communicative turn. Any response by the child is then treated as a meaningful, and if the child does not take a turn the caregiver will proceed to the next conversational turn (Owens, 2008).

One of the most common methods of initiating a turn-taking sequence is through the asking of a question by one communication partner (Clarke & Wilkinson, 2007). The person who asks a question expects some form of response from his or her communication partner, therefore, initiating a turn-taking interaction. Questions can be formulated for a variety of purposes. Piaget (1926) observed five reasons for children to ask the question "why". The different reasons are: (1) explaining cause, (2) why things are happening or have happened, (3) to determine human actions and intentions, (4) to justify events, and (5) to classify and evaluate information. Other reasons people ask questions are to gain information about objects, people, and locations. This is especially when people are seeking information to learn about their environment (Tager-Flusberg, 1993; Wilcox & Leonard, 1978).

Typical Development of Questions

Research has shown that in people developing typically, there is a definite pattern of development of question use (Tyack & Ingram, 1977; Piaget, 1926; James & Seebach, 1982; Rowland, Pine, Lieven & Theakston, 2003; Brown, 1968; Klima & Bellugi, 1966; Nelson, 1992, Parnell et al., 1984; Tager-Flusberg, 1993; Owens, 2008). Between 13 and 15 months, children will often first use rising intonation on a declarative statement to make requests, get the attention of others or express curiosity (Owens, 2008; Klima &

Bellugi, 1966). The use of rising intonation is the simplest form of generating a question, as it does not require knowledge of syntactic rules. Children, ages 12 to 18 months, are able to generate a question with rising intonation in even a one-word utterance, such as "cookie?" The second form of question generated by children ages 18 to 24 months is that of yes or no, where the response is either yes or no (Paul, 2001; Tyack & Ingram, 1977). These questions initially begin by making requests such as "more cookie" where the communication partner will often respond with a yes or no response (Paul, 2001). The information gained through the use of yes/no questions is limited because the child must be aware of what information the response of yes or no means. Once a child understands the formulation of yes or no questions, often by two years of age, he often makes attempts at the more complex wh-questions.

The wh-questions are used to obtain more information than can be provided by a yes or no response (Tager-Flusberg, 1993). There are six wh- words from which to choose: who, what, where, why, when, and how (James & Seebach, 1982). Research has shown that there is a typical sequence of development of the use of the wh- words (Paul, 2001; Tyack & Ingram, 1977; James & Seebach, 1982; Rowland et al., 2003; Bloom, Merkin, & Wootten, 1982). The wh-questions are most commonly acquired by children in the following order: what, where, who, when, how and why (Owens, 2008; Tyack & Ingram, 1977; James & Seebach, 1982; Rowland et al., 2003; Bloom et al., 1982, Tager-Flusberg, 1993). Children will understand and use questions to learn of objects (what), people (who) and basic events (where, what) between the ages of 24 and 30 months. This is a demonstration of the child's ability to be other oriented to things or people within the environment. Although some responses to wh- questions may be one-word utterances,

they are still more complex and give more information than a yes or no response (Tager-Flusberg, 1993). However, children often develop the use of wh- questions based on the type of response that will be given (Tyack & Ingram, 1977).

Answers to "what" and "where" questions are commonly given in response to questions regarding the child's immediate environment, especially people and objects. The other wh- questions often develop after the child demonstrates knowledge of more abstract concepts such as causality and time (Tager-Flusberg, 1993; James & Seebach, 1982). Children tend to ask questions about human actions, justification, and social relations rather than causality as they develop. Children develop their use of the different wh- questions as they develop their ability to formulate accurate responses to each of the wh- words when asked (Parnell et al., 1984). There are many factors that influence a child's acquisition of the wh- questions.

Question Use by AAC Users with Developmental Disabilities

It is very difficult to assess the overall language skills and understanding of AAC users (Nelson, 1992; Sutton et al., 2002). It is also difficult to ascertain if AAC users have an analytic or gestalt style of language learning. If an AAC user has a gestalt style of learning language, she or he may not understand the grammar, more specifically syntactic components of the phrases being generated. Therefore, she or he may have difficulty in the creation of novel and unique sentences or questions. AAC systems are designed with a variety formats to be used by people with significant communication disorders. Some AAC systems use the alphabet, while others incorporate words and others rely on graphic symbols (Trudeau, Sutton, Dagenais, de Broeck, & Morford, 2007).

Simply providing an individual with an AAC system does not guarantee that the person will become a competent communicator (Light et al., 1999). A competent communicator is viewed as someone who can become "other oriented" by asking questions and responding to information provided by a communication partner (Light et al., 1999). Studies have found that AAC users across the age span rarely request information from others (Lund & Light, 2007; Clark & Kirton, 2003; Muller & Soto, 2002). Lund & Light (2007) analyzed communication interactions of six males with cerebral palsy who had used AAC since preschool. They found only slight changes between communicative interactions when in preschool and approximately 15 years later. Clarke & Kirton (2003) analyzed the patterns of interaction of children, average of five years of age, who used AAC with peers who communicated verbally. Children were excluded from their research study if there was a diagnosed social disorder, such as autism, present. Their results demonstrated that the children who used AAC made fewer initiations and more responses than their verbal peers. The children who used AAC were also noted to make fewer, if any, response/initiation combinations to elaborate on the same topic compared to their peers. It was also determined that the children who used AAC most commonly communicated to confirm or deny information or share about themselves or emotions. The typical peers were identified to request information over 50% of communicative utterances, where the children who use AAC only used request functions approximately 9%, which is significantly less.

Muller & Soto (2002) analyzed the conversation patterns of three adults who used AAC with various communication partners. The researchers had three participants who used AAC who attended a day program that provided services to adults with severe

physical and speech impairments. The three day center attendees were selected due to their identification by the in-house speech-language pathologist as the most proficient AAC users at the facility. The participants' ages were 35, 38, and 52. All of the participants were identified as having receptive language skills within normal limits by the in-house speech-language pathologist, minimal to no functional speech, use of an AAC system with text-to-speech capabilities, use of the current AAC system for a minimum of three years, and no diagnosis of a cognitive impairment. The participants engaged with each other in one-to-one situations with one conversation partner, as well as in conversations with speaking partners who were employees of the day center program. Speaking partners were selected on the bases that 1) they were 18 years of age or older, 2) did not have a diagnosis of cognitive or speech impairments, 3) had some familiarity with the participants who were AAC users, and 4) were identified by one of the participants as a preferred conversation partner. Each of the three participants identified two people to engage in a conversation with, one fellow AAC user, and one speaking partner. Each communication dyad, six total, consisted of unstructured conversation that was approximately an hour in length and video recorded. Each conversation was transcribed in its entirety, including speech and nonspeech behaviors (e.g., vocalizations, eye gaze, facial expressions, etc.) Results of conversations that occurred between the participant and a speaking partner showed that speaking partners made almost all of the topic changes. Topic initiations by the natural speakers were in the form of questions rather than comments, with the question being markedly different than the present topic. In comparison, when the conversation was between two AAC users, both communication partners used the same amount of asynchronous discourse. However, AAC users tended

to initiate topics with the use of a comment rather than a question. In this study AAC users did not transition to unrelated topics easily compared to topics that had connectivity to one another. For example, the AAC users would have more difficulty transitioning from a conversation about sports to a conversation about shopping, compared to transitioning from a conversation about sports to a conversation about exercise. The researchers also compared the percentage of the conversation that was the participants' contributions compared to that of their conversation partner. The AAC user was found to contribute to the conversation 36.7% when engaged with a speaking partner who contributed 63.3%, compared to 47.9% with a fellow AAC user (52.1%). Another area analyzed by the researchers was the distribution of summoning power between conversation partners. They found that during the conversation with a speaking partner, almost all obliges were initiated by the verbal communicator using yes or no question, as well as open-ended questions. It was also discovered that the AAC users often responded to the yes or no questions using nonspeech modes (e.g., eye gaze, gestures, facial expression, etc.) rather than using the AAC system. During conversations between two AAC users, neither partner was more likely to ask yes or no questions or open-ended questions. In fact, required turns were rare within the conversations between the two AAC users. During the dyads involving two AAC users, an average of 2.4 yes or no questions and 3.7 open-ended questions were used per conversation, compared to 65.7 yes or no questions and 10 open-ended questions when the dyad included a speaking partner. The final area of analysis conducted by the researchers was the percentage of time used for topic development compared to the time needed for conversation maintenance or repair. Researchers found that the percent of conversation devoted to

topic development was similar between all dyads, an average of 49.3%. There was a marked difference in the amount of time devoted to conversation repair, 25% with a speaking partner, compared to 0% with a fellow AAC user. Conversation maintenance occupied 25% of the conversation with a speaking partner, and 48% with another AAC user. The results of this study confirm an asymmetry of conversation between an AAC user and speaking partner. Results from this study also pointed to an equality of conversation between AAC users.

Light et al. (1999) demonstrated that AAC users between the ages of 10 and 44 years old could learn to use partner-focused questions. The six participants all used AAC, had functional hearing and vision, seldom initiated social interactions with others, understood basic social conversation, participated in discussions about things outside of the immediate environment, and could express, as well as comprehend, basic question forms. The study had three phases: baseline, instruction in partner-focused questions, and generalization and maintenance. The participants were observed during naturally occurring situations to measure how many partner-focused questions were used and the number of opportunities that existed in each situation. Once the participants had been observed to demonstrate a consistent percentage of partner-focused questions based on the opportunities present, the researchers began the intervention phase. During the intervention phase, the researchers determined between five and 10 partner-focused questions to target that were not observed during the baseline phase. The questions were designed to: 1) be easily understood by the participants, 2) be useful in a variety of contexts and with a variety of communication partners, and 3) be age appropriate. The researchers programmed the targeted partner-focused questions as single-hit messages in

each participants AAC system. Instruction was provided to each participant individually. The instructor stated the goal of the intervention to the AAC user and emphasized the importance of using partner-focused questions. The instructor or another AAC user, who was not a participant in the study, presented a model of a situation in which partner-focused questions were used. The instructor used "think alouds" to clarify and explain how and when to use partner-focused questions. Multiple opportunities were then given to the AAC user to practice asking partner-focused questions. The instructional settings took place in a naturally occurring environment for at least 50% of the sessions and included activities like role-playing. After each session the instructor provided feedback to the AAC user about his or her performance and use of partner-focused questions. Discussions took place to describe and reenact situations in which the AAC user did not use partner-focused questions when it was expected. Through this instruction process, all six of the participants were able to learn to ask partner-focused questions across a variety of environments and with a variety of communication partners. By learning the use of partner-focused questions, the participants in this study demonstrated the ability to be other-oriented which could, in turn, lead to a perceived increase of communicative competence. Having greater communicative competence, the participants in this study would be able to build social relationships with others through the use of partner-focused questions, which could lead to an overall improved quality of life.

Purpose

The purpose of this study was to investigate a group intervention strategy to improve the social communicative competence of adult AAC users by increasing their

use of partner-focused questions. Specifically, the questions being explored in this research were:

1) Do AAC users use partner-focused questions with an unfamiliar communication partner?

2) Is group intervention effective in increasing the use of partner-focused questions with unfamiliar communication partners?

3) Are AAC users who use partner-focused questions viewed as having better communicative competence by a third-party viewer?

CHAPTER II

Method

Participants

There were six people between the ages of 18 and 49 who used AAC who participated in the study. All AAC participants met eligibility criteria stated in Table 2. Participant or guardian confirmed eligibility criteria that could not be determined through screening methods by the researcher.

Information about the study and the participant selection criteria was distributed through multiple Internet listservs for persons who use, or support the use of, AAC systems (i.e., PACT, ACOLOUG, ASHA Division 12), postings in the speech-language hearing clinics at the University of Tulsa and the University of Kansas, and newspaper advertisements in the local newspapers to recruit the AAC user participants. Six families from the Midwest area of the United States contacted the researcher to indicate interest in having their family member participate in the study. The researcher held an initial meeting with each participant to confirm that she or he met the eligibility criteria for the study.

The six people who used AAC represented a range of age between 18-49. They each had a diagnosis of cerebral palsy or Down syndrome and used a dynamic display speech-generating device.

Table 2

AAC Eligibility Criteria

Inclusionary Criteria for AAC Users
Diagnosis of a developmental disability with the absence of a social disorder such as autism (i.e., Down syndrome, cerebral palsy)
Had inadequate speech to meet daily communication needs (<75% intelligible to familiar and unfamiliar communication partners as rated by a primary communication partner)
Primary mode of communication for the participants was a dynamic display AAC system (see Appendix A)
Used an AAC system with voice output
Had used their current AAC system for a minimum of 12 months
Demonstrated functional hearing abilities at conversational loudness as indicated by a hearing screening
Had functional vision abilities as indicated by correct naming of photographs of common objects at 20 feet distance
Independently navigated through at least two page sets of the AAC system
Engaged in turn taking when involved in conversation
English was identified as the spoken language in the home

Jared. Participant 1, Jared, was a 28-year-old male with cerebral palsy. He had good functional use of his hands, legs, and head. He ambulated independent of any supports. He had no identified hearing or vision impairment. Jared communicated via word approximations, approximated sign language through finger spelling, facial expressions, head movements for yes and no responses, and a Dynavox V (www.dynavoxtech.com) using the Gateway 45 page layout through direct access with his index finger on his right hand. He had a variety of personal vocabulary that had been added to his AAC system to meet his individual communication needs, including sentences and single words. Jared also used letter-by-letter spelling on his AAC system

to communicate. He lived at home with his mother and ran his own vending machine business.

Alice. Participant 2, Alice, was a 24-year-old female with Down syndrome as well as apraxia of speech secondary to a stroke at the age of 2-years. She had good use of her upper extremities and functional use of her lower extremities. She utilized a power wheelchair when out in the community to reduce her fatigue and motor demands. Alice communicated through verbal approximations, gestures, and a MiniMerc (www.assistivetech.com) with Boardmaker Speaking Dynamically Pro (www.mayer-johnson.com) software through direct access with her right pointer finger. She had a wide variety of personal vocabulary that had been added to her AAC system to meet her individual communication needs consisting primarily of sentences and phrases. She lived at home with her mother, father and younger sister. She was employed and helped with organizing, sorting, and mailing statements for the family business.

Lisa. Participant 3, Lisa, was an 18-year-old female with severe spastic cerebral palsy. She had functional use of her hands to drive her power wheelchair using a joystick. She did not have functional use of her legs. Lisa was dependent in all functions of daily living. She communicated by means of eye pointing, vocalizations, and a Vanguard (www.prentrom.com) using a Unity 84 software page setup, which she controlled via row and column scanning with the built-in head tracking system. The Unity software is comprised of a prestored core vocabulary. Lisa occasionally used letter-by-letter spelling to communicate as well. Lisa lived at home with her parents, and had part-time employment doing clerical work.

John. Participant 4, John, was an 18-year-old male with severe spastic cerebral palsy. He had gross motor abilities in his forearms to control his power wheelchair via a joystick; however, he did not have functional use of his hands for fine motor tasks. He did not have functional use of his legs and was dependent in all functions of daily living. John communicated by means of facial expression, eye pointing, vocalizations, and an ECO-14 (www.prentrom.com) using the Word Core 144 software page setup, which he controlled via row and column scanning with a single switch that he accessed with his right knee. John frequently used letter-by-letter spelling to communicate. He lived at home with his parents. He was still enrolled as a full time student at his local public high school in primarily special education classes.

Tara. Participant 5, Tara, was a 49-year-old female with severe spastic cerebral palsy. She did not have functional use of her hands or legs and was dependent in all activities of daily living. She used a manual wheelchair that had to be controlled by another person. She communicated by means of vocalizations, eye pointing, facial expression, and a Vanguard (www.prentrom.com) using the Unity 84 software page setup, which she controlled via row and column scanning with a single head-mounted switch. The Unity software included a variety of prestored words and phrases. Tara lived in a group home and attended an adult day services program during weekdays.

Keith. Participant 6, Keith, was a 38-year-old male with Down syndrome. Keith had good motor skills and walked independently. He wore glasses to correct his vision to within normal limits. Keith communicated through verbal approximations, gestures, approximated sign language, and a Vantage (www.prentrom.com) using the Unity 45 one-hit software page setup, which he accessed through direct selection using his pointer

finger on both hands. The Unity 45 software included a variety of prestored words and phrases. Keith also used personalized vocabulary added to meet his daily communication needs. Keith lived at home with his parents. He was not employed.

Communicative Competence Judges. Forty community members were recruited through flyers posted within the community surrounding the University of Tulsa to judge communicative competence. These people were recruited to be third-party observers who rated the overall communicative competence of each AAC participant before and after their intervention. All judges met the criteria listed in Table 3.

Table 3

Communicative Competence Judge Eligibility

Inclusionary Criteria for Communicative Competence Judges
Completion of at least one post-secondary education course
Possessed functional hearing as self-reported and confirmed through the ability to respond to questions in casual conversation by the researcher
Possessed functional vision abilities as self-reported and confirmed by the oral reading of the first paragraph of the video instructions to the researcher
Indicated no previous knowledge or interaction with AAC systems
English was identified to be the primary spoken language
Had no diagnosis or indication of a communication disorder

Procedures

This study had two components. The first component explored the use and teaching of partner-focused questions to people who use AAC systems. The second dealt with the perceived communicative competence of AAC users by people with limited or no knowledge of AAC.

Partner-focused question treatment. The investigation with AAC users involved three phases: pre-intervention assessment, group intervention targeting the use

of partner-focused questions, and post-intervention assessment. The number of questions used, specifically partner-focused questions, by each AAC user was the dependent variable.

Pre-intervention assessment consisted of administration of the Peabody Picture Vocabulary Test—Fourth Edition (PPVT-4; Dunn & Dunn, 2007) for descriptive purposes and a question-elicitation conversation with the researcher or a trained unfamiliar communication partner. The language abilities of the participants are described in Table 4. Pre-intervention data was collected during one individual session lasting for forty-five minutes to two hours. Participants received small group (two AAC users) intervention targeting the use of partner-focused questions. Three groups were formed for the intervention phase based on the residential location of each participant. The first grouping consisted of Jared and Alice, who received their intervention at Hardesty Library in Tulsa, Oklahoma. Lisa and John made up the second pairing. They received their intervention at their homes in Wichita, Kansas, alternating each session between the two. The final grouping was Tara and Keith, who received their intervention sessions at a church in Topeka, Kansas. The group intervention consisted of four-one hour sessions. Finally, participants completed a post-intervention session. The post-intervention session was an individual session during which a question-elicitation conversation with an unfamiliar communication partner took place.

Table 4

Language indicators of the participants

Participants	Receptive Language Skills	Expressive Language Skills
#1 Jared	PPVT test score <1%ile. In functional context, responded with >80% to 1-2 step commands, and simple wh-questions	Speech (approx, 20% intelligible to unfamiliar partner); gestures; on AAC system navigated through multiple pages; took obligatory turns when engaged in conversation
#2 Alice	PPVT test score <1%ile. In functional context, responded with >60% to 1-2 step commands, and simple wh-questions	Speech (approx 10% intelligible to unfamiliar partner); gestures; on AAC system navigated through multiple pages; took obligatory turns when engaged in conversation
#3 Lisa	PPVT test score <1%ile. In functional context, responded with >90% to 1-2 step commands, and simple wh-questions	Vocalizations; eye pointing; head nod/shake; on AAC system navigated through multiple pages; took obligatory turns when engaged in conversation
#4 John	PPVT test score <1%ile. In functional context, responded with >90% to 1-2 step commands, and simple wh-questions	Vocalizations; eye pointing; gestures; on AAC system navigated through multiple pages; took obligatory turns when engaged in conversation
#5 Tara	PPVT test score <1%ile. In functional context, responded with >70% to 1-2 step commands, and simple wh-questions	Vocalizations; gestures; eye pointing; on AAC system navigated through multiple pages; took obligatory turns when engaged in conversation
#6 Keith	PPVT test score <1%ile. In functional context, responded with >80% to 1-2 step commands, and > 60% when responding to simple wh-questions	Speech (25% intelligible to unfamiliar communication partner); gestures; on AAC system navigated through multiple pages; took obligatory turns when engaged in conversation

Eligibility. Eligibility for participation in the study was determined by a hearing screening, collection of a language sample during casual conversation with the researcher, and response to an eligibility questionnaire completed by the participant or his or her guardian (see Appendix B). The hearing screening, which was conducted using a portable audiometer, determined the participant's ability to hear speech at conversational loudness with or without the use of hearing aids. The 50-utterance language sample was collected in the home, work, or clinic environment depending on the availability of the

person participating in the study. The researcher watched the video of each language sample and determined whether each participant demonstrated the ability to independently take a conversational turn, as well as confirmed that AAC was the primary mode of communication.

Pre-intervention assessment. Once eligibility was established, the PPVT was administered to the participant for descriptive purposes. The participant was also asked to engage in a question-elicitation conversation, referred to from this point on as the Double Interview (Winner, 2007). The Double Interview was chosen because it provided models of asking question and an obligation of the AAC user to also ask questions. The Double Interview was conducted with an unfamiliar communication partner who was either the researcher or a trained speech-language pathology graduate student. The Double Interview portion was video recorded and transcribed. See Appendix C for an outline of the Double Interview procedure used. It consisted of an interview procedure that utilized the same 10 questions with all participants (See Appendix D). A transition from the researcher being the interviewer to the interviewee was made with the use of photographs (See Appendix E). Finally, each participant was provided a list of question words as a visual support while they took on the role of the interviewer (See Appendix F).

Intervention. Once pre-intervention assessment data was collected, the participants who used AAC received four-one hour group intervention sessions, in the pairs, targeting the use of partner-focused questions once a week for four weeks. Prior to the first group intervention session, if the targeted questions or words were not located on the AAC users' systems, either a family member or the researcher programmed the

targeted words or phrases into his or her system. The five questions targeted were: 1) Where is your favorite place to visit or travel?, 2) What is your favorite holiday?, 3) Do you have any pets?, 4) Who would you like to meet?, and 5) How many people are in your family?

Aided input, role-playing, and video social autopsies were the primary teaching strategies and methods used during intervention. Aided input, also referred to as aided language stimulation, is a teaching strategy that requires the communication partner to model the use of the AAC system by physically accessing messages or key words on the AAC user's system while he/she talks (Goosens', 1989; Beck, Stoner, & Dennis, 2008). The use of aided input or inclusion of a similar device provides equity between the verbal model of questions for verbal communicators and system modeling for AAC users. Video social autopsies consisted of reviewing video recordings of the participants practicing the targeted skill of using partner-focused questions. The video was paused to demonstrate when good partner-focused questions were used, as well as when a communication breakdown occurred. The researcher described the cause of the breakdown explicitly. Then the participants practiced the communicative interaction again without a breakdown occurring through verbal cueing by the researcher. The first session introduced the targeted partner-focused questions and used aided input, if possible, for each of the AAC user's specific device layout. The five targeted questions were selected to teach the use of five different question words: where, what, do you, who, and how many. The participants observed pre-recorded videos demonstrating good and inadequate use of partner-focused questions. While watching the videos, social autopsies were conducted pointing out the communication breakdowns and good use of

partner-focused questions. Following the videos a discussion was held to explain the importance of asking questions to others and using nonverbal communication with the participants.

One week following the first session, the second session focused on the AAC participants practicing the targeted questions out of context. At the beginning of the session the five questions being targeted were reviewed with the use of aided input, if possible, for all of the AAC user's system displays. Once the AAC users demonstrated the ability to generate the five questions being targeted, they were paired up with another AAC user for more contextually based practice. The paired practices were video recorded so that they could be used to conduct a social autopsy during the third session.

The video recordings were used to conduct social autopsies with each AAC pairing during the third session, which occurred one week following session two. A discussion and review of the importance of asking partner-focused questions were held followed by continued practice by the AAC users. During this intervention session, the AAC users were paired with verbal communicators to practice the use of the five questions being targeted to gain information. The practice was again video-recorded and used during the fourth and final session.

The fourth and final session consisted first of social autopsies conducted by the researcher and AAC users followed by one last practice session of asking partner-focused communication between an AAC user and familiar communication partner. Throughout the first three intervention sessions, the communication partner used aided input, or verbal cues, to model the production of the targeted or desired question of the AAC user. During the fourth session, aided input was not used; however, the researcher still

provided verbal cues to the AAC user by providing key words, such as the beginning question word.

Post-Intervention Assessment. The Double Interview was repeated with a trained unfamiliar communication partner within one week following the last intervention session for all participants except Tara. Tara's post-intervention assessment was completed three weeks following her last group intervention session due to hospitalization. The post-intervention sessions were video recorded and transcribed.

Data Collection. Each participant who used AAC was video recorded during all phases of the study. The video camera was used to capture the participants' face, upper body, and vocalizations or the synthesized speech of the AAC system. During group intervention the participants were seated so that the camera could capture the facial expressions, gestures, and vocalizations or synthesized speech of both AAC users and their AAC systems.

Video clips containing a portion of the pre- and post-intervention sessions between the AAC users and researchers were viewed and rated by adults with limited, to no, previous experience with AAC. The communicative competence judges viewed 12 video clips ranging in length from three to eight minutes, one of each AAC user pre- and post-intervention, and rated their communicative competence on a 10-item questionnaire using a 5-point Likert-type scale (Hulley& Cummings, 1988) (See Appendix I). The 5-point scale was designed so that 1 equaled definitely true and 5 equaled definitely false. The video clips contained the third question asked in each role. The video clips varied in duration to include one question, response and any follow-up comments for each participant as the interviewer and the interviewee. The video clips were randomized so

that participants were unaware if they were viewing a pre-intervention or post-intervention video for each AAC user. The summation of the 10-items on the questionnaire based on observer response served as the dependent variable.

The communicative competence judges were placed in small groups based on their availability. The video was played on a projection screen with audio output through external speakers at a volume indicated by all participants for each group was adequate to hear all persons on the video. Participants completed 12 paper and pencil questionnaires, one for each video viewed. The video recordings were paused for up to three minutes following each individual clip to allow participants time to answer each question. The best possible score was 14. Each questionnaire was totaled.

Data Transcription and Coding. Each interview conducted by an AAC participant was transcribed and coded using the Systematic Analysis of Language Transcripts (SALT) program (Miller & Chapman, 2008). The transcripts were coded to mark general question use, partner-focused question use, and implied question use, which are defined in Table 5. These variables were selected to capture the number of questions and partner-focused questions used spontaneously by the AAC user with unfamiliar conversation partners.

Table 5

Transcription Coding Definitions

Code	Definition	Example
[PFQ] – Partner-Focused Question	Questions that are directed toward a communication partner that are focused on the partner, his or her interests, or experiences	"What do you think of this weather?"
[MQ] – Modeled Partner-Focused Question	The use of a partner-focused question by the researcher or trained unfamiliar communication partner	"What is your favorite type of animal?"
[GQ] – General Question	Any question that was not necessarily directed toward the communication partner or did not seek specific information about the communication partner, his or her interests, or experiences	"What is the weather like?"
[IQ] – Interpreted as a Question	An attempt to gather information from a communication partner that may have been general or partner-focused, but did not use any question words or traditional syntax. These questions may include nonverbal communication cues as well (i.e. raising eyebrows, pointing, and changing eye gaze)	AAC user says "pets" and changes eye gaze toward the communication partner with a questioning look demonstrated through the eyebrows.

Data Analyses. Data describing the use of questions by AAC users during an interview with an unfamiliar communication partner, the researcher or other trained person, was obtained through SALT analyses. The variable of interest was the number of partner-focused questions asked by the AAC user prior to intervention compared to the number of partner-focused questions following small group intervention during the Double Interview with an unfamiliar communication partner. Descriptive information was used to analyze the data.

In order to explore the perceived communicative competence of the AAC users in both conditions, the averages across all communicative competence judges were calculated for each AAC participant by condition. The average for each question was calculated for each AAC participant by condition as well.

Reliability. Video segments representing one-third of the total interviews, a total of four, completed by the participants were chosen for inter-observer reliability. This procedure selected one-third of the total participants randomly representing each condition equally. Two speech-language pathology graduate students were trained in the transcription and coding procedures to establish reliability. Reliability was conducted for both transcription and coding. Reliability was calculated by dividing the total number of agreements by the total number of agreements plus disagreements. Inter-observer reliability was used to measure the agreement of transcription of the video recorded interviews by two observers. The aspects of transcription included in the reliability measure were word-for-word transcription and utterance boundaries. The average reliability for transcription was 94%. Any disagreements relative to transcription were resolved prior to coding by discussion and review of the video recorded interviews. Coding reliability was then used to measure the agreement when the observers signed codes to the same transcriptions between two observers. The average reliability for coding was 98%.

Pre- and Post-assessment Intervention Partner Fidelity. The researcher trained all novel communication partners for the question-elicitation task through the use of video instruction. Each trained communication partner then participated in a practice session where he or she conducted the Double Interview with a verbal communicator.

The practice session was video taped and reviewed with the researcher to ensure proper execution of the Double Interview. Once each novel communication partner demonstrated understanding of the procedures within the Double Interview, they began to collect pre-intervention assessment information with the AAC participants. Following the post-intervention session, fidelity was determined by an undergraduate speech-language pathology student rating one-third of the Double Interview sessions with both conditions equally represented to determine that the procedure was conducted as described (See Appendix G). All four were found to contain all 10 components on the checklist.

Treatment Fidelity. The researcher herself conducted all 12 of the group intervention sessions. Fidelity was determined by an undergraduate speech-language pathology student rating one session of each phase of intervention, for a total of four sessions, to determine that they were conducted as described (See Appendix H). All of the rated intervention sessions were found to contain all steps of the procedural framework indicated on the treatment fidelity checklist.

CHAPTER III

Results

The use of partner-focused questions of six adults with complex communication impairments resulting in the use of augmentative and alternative communication (AAC) systems were examined as they interviewed an unfamiliar communication partner before and after intervention. Persons unfamiliar with AAC judged the communicative competence of the AAC users before and after intervention.

Question Use Data

As depicted in Figure 1, four of the six participants increased the number of partner-focused questions used following intervention. Five of the six AAC participants used at least one partner-focused question prior to receiving intervention. All of the AAC users used at least five questions, general, interpreted, or partner-focused, during their pre-intervention interview. See Figure 2. All six of the AAC participants used at least one partner-focused question during their post-intervention interview. The six participants also used other question formats during their pre- and post-intervention sessions. See Figure 2.

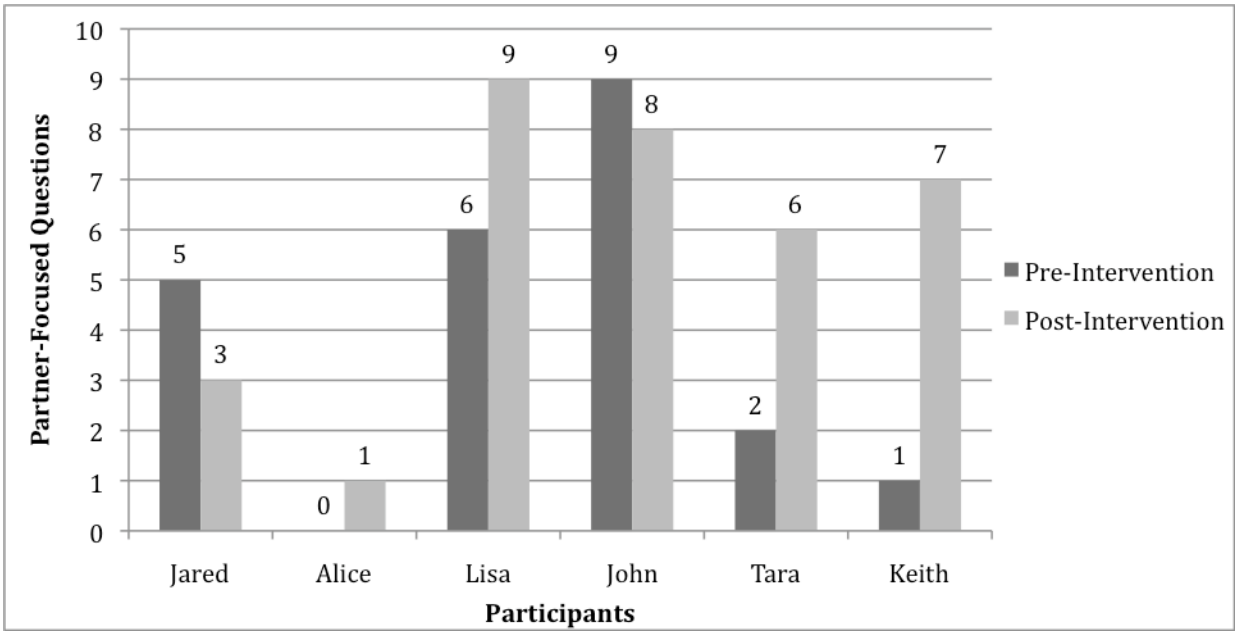

Figure 1. Comparison of Partner-Focused Question Use.

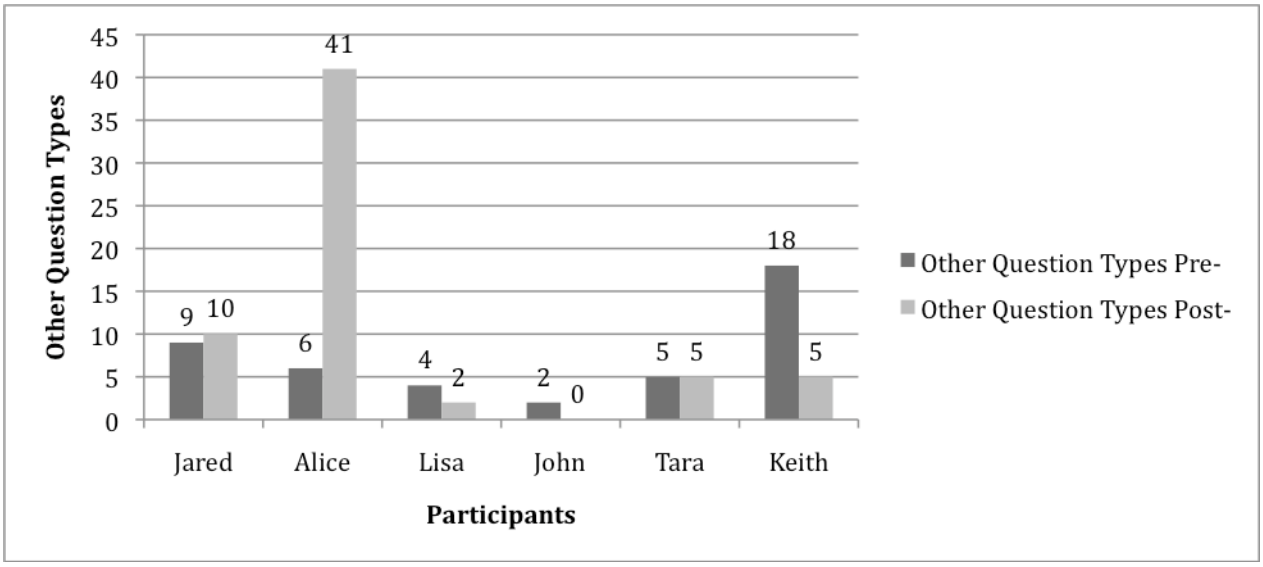

Figure 2. Comparison of other question types pre- and post-intervention.

Perceived Communicative Competence

As illustrated in Figure 3, five of the six participants had a lower total score following intervention, indicating higher perceived competence. The participants varied in their sociolinguistic and sociorelational skills as indicated by the responses of the communicative competence judges (N=40) on the communicative competence questionnaire (Appendix I). See Table 6.

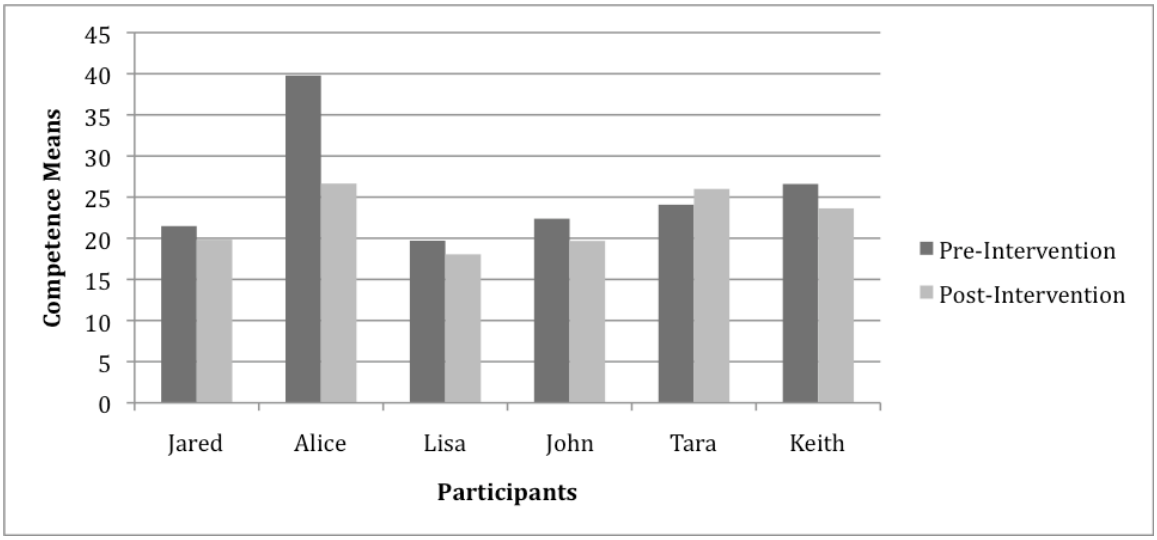

Figure 3. Perceived communicative competence.

Table 6

Competence judge averages for each AAC user based on condition

Question	Jared Pre	Jared Post	Alice Pre	Alice Post	Lisa Pre	Lisa Post	John Pre	John Post	Tara Pre	Tara Post	Keith Pre	Keith Post
1	1.45	1.25*	4.38	2.28*	1.35	1.25*	1.60	1.40*	1.93	2.10	2.20	1.60*
2	1.98	1.35*	4.38	3.15*	1.40	1.25*	1.50	1.43*	1.58	1.85	2.75	1.45*
3	1.48	1.38*	2.13	1.98*	1.43	1.40*	1.30	1.48	1.60	1.55*	1.65	1.73
4	3.28	3.53*	2.58	3.23*	4.2	4.30*	3.93	4.20*	3.40	3.15	2.68	3.20*
5	2.53	2.1*	4.4	2.98*	1.7	1.55*	3.00	1.93*	2.90	3.03	3.08	3.05*
6	1.53	1.25*	4.28	2.05*	1.28	1.15*	1.40	1.38*	1.58	2.25	2.30	1.55*
7	2.9	2.78*	3.85	2.08*	3.08	2.63*	3.55	3.20*	4.00	4.05	3.35	2.25*
8	2.08	2.00*	4.23	2.45*	2.10	1.68*	2.1	2.00*	2.08	2.45	3.15	2.45*
9	2.15	2.18	4.48	3.15*	1.93	1.58*	2.25	1.85*	2.45	2.90	2.90	2.95
10	2.2	2.05*	4.33	3.13*	1.60	1.43*	2.05	1.68*	2.50	2.88	2.90	3.18

Note: An asterisk (*) indicate an increase in the skill for that particular question on the competence questionnaire

CHAPTER IV

Discussion

This was a study of the effectiveness of group intervention in the teaching of partner-focused questions to AAC users. The purpose of this study was to investigate using group intervention to improve the social communicative competence of adult AAC users by increasing their use of partner-focused questions. The quantitative information provided answers to three questions posed in this research. A more qualitative examination of the data provided insights into possible influences that contributed to the finding of being perceived as having greater communicative competence during the post-intervention assessments. The observed differences will be presented, followed by a discussion of the perceived differences and other observations that may have influenced the scoring of the communicative competence judges.

Observed Differences

The participation outcomes of the AAC users differed in the two experimental conditions. As predicted, third party communicative judges viewed four out of the six participants to be more communicatively competent following group intervention. Though only four of the six participants increased the total number of partner-focused questions during their post-intervention assessment, a majority of the AAC participants were still viewed as having more communicative competence by unbiased third-party judges. The judges responded to five questions that reflected sociolinguistic skills, questions 1, 3, 4, 7, and 9 (See Appendix I). The communicative competence also included four questions that reflected sociorelational skills, questions 2, 5, 6, and 8 (See Appendix I). The tenth question asked the judges to rate if the AAC user seemed to be an

overall competent communicator. The interaction abilities of the AAC users appeared to have a greater impact on their perceived competence rather than their language abilities, specifically through the use of questions. Although some participants had an increase in vocabulary due to message programming within their AAC systems, language was not specifically targeted during intervention. Specifically, five of the participants' increased social communication abilities that are related to sociolinguistic and sociorelational skills over the course of the intervention sessions.

Sociolinguistic. One influential factor of a communication interaction is the inclusion of sociolinguistic skills. Demonstration of sociolinguistic knowledge and understanding can be observed through the use of turn-taking, staying engaged in conversation, and initiating appropriate topics of conversation (Light, 2003; Light 1989). For AAC users, turn-taking attempts do not always begin with use of the AAC system, but instead may be made with other communication modalities (gestures, facial expressions, vocalizations, etc.). Once turn-taking abilities are present other conversational difficulties may become evident.

Staying engaged in a conversation requires that the AAC user has vocabulary that is either appropriate for the current topic of conversation, or to change the topic of conversation. The AAC users must also have knowledge about what vocabulary is appropriate for the given situation with the selected communication partner. However, full participation in conversations that require topic elaboration or the use of partner-focused questions is at times difficult for AAC users (Datillo et al., 2008; Lund & Light, 2008; Lund & Light, 2007). An AAC user's word choice and phrase or sentence generation either maintains the flow of the interaction or can cause a communication

breakdown. All of the AAC participants in this study programmed at least one question button in their AAC system during their participation. Five of the six participants had a large vocabulary, over 2500 words or phrases, accessible through their system. One participant had a smaller vocabulary, approximately 1200 words or phrases available. Additional vocabulary items beyond those of the targeted questions were added only at the request of the AAC participant, as the focus of this study was on the social competence rather than linguistic competence. It is important that AAC users understand that sociolinguistic skills are context dependent and should be flexible based on the intended communication partner. The ability to understand and demonstrate the use skills related to sociolinguistics can impact the quality of an AAC user's conversation.

Consider the following discourse that occurred while an AAC participant was being interviewed during a pre-intervention assessment session between Alice (A), an unfamiliar communication partner (R), and Alice's mother (M):

R: When is your birthday Alice?
A: {vocalizes and points to her ear}.
M: Her birthday is November 16th.
R: I like another fall birthday.
M: Yeah.
A: I done.
M: Yeah you're not going to sit still for this are you?
A: I done.
A: {gets up and leaves the table}.

Alice was judged to be an inactive participant during this interaction. She received an average score of 4.38, which falls between the categories of more false than true and definitely false, on the statement "the AAC user took an active part in the conversation". This rating would suggest that Alice did not exhibit skills in the area of

sociolinguistics and therefore was perceived with low overall social communicative competence. Alice attempted to express her desire to discontinue the interview through the use of the verbal phrase "I done", but did not address a specific communication partner through shift of eye gaze or use of name, with whom to interact and communicate her message. The communicative competence judges rated Alice's overall desire to communicate, question 6, at an average of 4.28, which reflected Alice's desire to discontinue the interview. She was rated as "more true than false" when asked about her desire to communicate. Although the competence judges rated the questions asked to Alice as "appropriate", receiving an average score of 2.13, Alice did not take a required turn when asked a question by the unfamiliar communication partner. Instead, Alice changed the topic by making a comment about the noise level in the room. In comparison, when asked a question by her mother, Alice did take a conversational turn, but only to end the interaction. Alice was not perceived to be a competent communicator during this interaction, receiving an average score of 4.33 by the communicative competence judges.

The AAC system that Alice used contained primarily phrases with some specific preprogrammed words, such as what can be ordered at specific restaurants. During the pre-intervention assessment, Alice's mother frequently provided responses if they were not available in Alice's AAC system. There was only one question available on Alice's AAC system during the pre-intervention session, "Have you seen any good movies lately?" She communicated minimally using her AAC system throughout the interview, but instead relied on other modes of communication. She used many gestures, as well as

references to the picture supports provided by the unfamiliar communication partner, that were inferred to be questions.

R: *What can you ask to get to know me better?*

A: *{vocalizes}.*

M: *{gets up from the table}.*

A: *XXX Mom.*

M: *{from other room} Yeah.*

R: *XXX*

M: *Well hold on*

R: *{makes loud belching sound}.*

M: *is that yuck?*

M: *that pen is yuck?*

R: *That's my favorite pen.*

M: *Oh.*

M: *{returns to the table with a card holder and places the picture in it}.*

M: *Alice, look!*

R: *These are my pictures Alice.*

R: *What can you, what can you ask me, to get to know me better?*

A: *{points to one of the pictures}*

R: *{interprets it as whose that}*

R: *Well in this picture, I'm here with 2 of my friends at the ice skating rink*

A: *{vocalizes}.*

When Alice was given the opportunity to choose the topic of conversation, she communicated more frequently and freely. During this portion of the pre-intervention session, she made her understanding of turn-taking obvious as she first got the attention of her mother before making a comment or request. Her identified communication partner was apparent. Alice was perceived by the communicative competence judges to have somewhat limited vocabulary to convey her ideas and feelings. She received a

score of 2.58 on the statement "The AAC user's vocabulary was too limited to convey his or her ideas or feelings," which indicated the statement was more true than false. She showed some interest and engagement in her communication partner by commenting on a photograph of the partner. Another factor that might have influenced Alice in the role of the interviewer was that she received a lot of encouragement and positive feedback from her mother. This feedback may have made Alice feel more comfortable in the given situation. Although Alice continued to rely on communication modalities other than her AAC system during the pre-intervention assessment, her communication partner made interpretations of Alice's communication attempts.

Compare the previous interactions to those collected and analyzed following her participation in group intervention focusing on the importance, and how-to, of using partner-focused questions. Communication generated using the AAC system is indicated in all capital letters. The data collection took place in a similar environment and situation as the pre-intervention assessment with the exception of Alice's mother not being present. In this excerpt Alice is being interviewed by an unfamiliar communication partner:

R: *How many pets do you have?*

A: *I USED TO HAVE A DOG NAMED ABBY, SHE WAS A WHITE AND BROWN CLUMBER SPANIEL.*

R: *Aww.*

A: *I WANT MORE PETS.*

R: *You do?*

R: *What kind?*

A: *OUR LAST FISH DIED JUST A FEW DAYS AGO.*

R: *You want another fish?*

A: *XXX XXX TANK FOR A LONG TIME.*

A: I USED TO HAVE A CAT NAMED SNOWY, SHE ADOPTED OUR FAMILY, SHE LIVED OUTSIDE.

R: Yeah.

A: {looks at the pictures}.

R: What can you ask me?

R: What do you want me to tell about that one?

A: {holds up a picture and hands it to the researcher}.

During this interaction, Alice displayed not only refined turn-taking abilities with an unfamiliar communication partner, but also began to display skills related to engagement within a cohesive conversation, as indicated by average scores of the communicative competence judges. Alice was perceived as having "a more active part in the conversation" during this post-intervention session receiving an average score of 2.28 on one of the questions that reflected this particular sociolinguistic skill. During this interaction, it appeared she attempted to remain engaged in the topic that her unfamiliar communication partner initiated, pets and animals. She increased the use of her AAC system. Alice continued to demonstrate her more active participation in the conversation while in the role of the interviewee during the post-intervention session as well:

A: DO YOU WANT TO KNOW ABOUT MY FAMILY?

R: Tell me who's in your family, who is there?

A: MY DAD'S NAME IS HAL.

R: Hal's your dad.

A: HE'S A DOCTOR.

R: Who else is in your family?

R: What about sisters?

R: Don't have any sisters?

A: Hmmmm.

R: Hal is your dad and he is a doctor, I've met him.

A: DO YOU WANT TO KNOW WHO I WOULD LIKE TO MEET?

R: Who would you like to meet?

R: I would like to meet John Travolta.

A: I WOULD LIKE TO MEET CORBIN BLOOM HE PLAYS XXX IN HIGH SCHOOL MUSICAL.

Alice was judged to be a more effective communicator by the rate in which she communicated as measured by the communicative competence judges. She received an average rating of 2.08 during her post-intervention conversation compared to 3.85 on the statement "The AAC user's rate of communication was just right (neither too fast nor too slow)". This rating indicated that the communicative competence judges felt that the statement was more true than false during the post intervention session, and more false than true during the pre-intervention session. This indicates an increase in Alice's sociolinguistic abilities. Although Alice did not ask partner-focused questions, her use of general questions allowed her communication partner to transition to the current topic of conversation with ease. The opportunity to practice taking turns during intervention targeting partner-focused questions may have positively impacted her role as an active participant in conversation and use of an appropriate communication rate. Participation during group intervention sessions may also have provided Alice the opportunity to practice using her AAC system in a question and response type conversation. During the intervention sessions, she was able to observe another AAC user create and respond to questions. Initially, Alice became very agitated and upset if anyone else tried to touch her AAC system especially for aided input by the researcher. However, by the second group intervention session she was very willing to allow the other AAC user to touch her AAC system. She never attempted to touch his AAC system but would watch with focus

as he compiled messages. The judges also indicated that Alice had more of a desire to want to communication during her post-intervention session. She received an average score 2.05 during the post intervention compared to 4.28 initially. This increase may be a result of practicing the sociorelational skills of asking partner-focused questions and turn taking in conversation during the intervention sessions. Alice's average score on the statement "The AAC user seemed to be a competence communicator" was 3.13 following intervention compared to 4.33 during the pre-intervention assessment. Although the score indicated the judges were "neutral" about the statement, it is an improvement over the pre-intervention average rating.

While Alice's initial sociolinguistic difficulties were with active participation and rate of communication, Keith, initially exhibited a communication rate that was deemed inappropriate and a more passive role as a communication partner. He was also perceived to have a lack of desire to communicate. He often selected topics of conversation within a specific group (people, places, food, etc.) located within his AAC system. He had access to a wide variety of vocabulary, including questions and question words during the pre-intervention assessment. This is apparent in an excerpt of his communication style while being interviewed. The communicators included Keith (K) and an unfamiliar communication partner (R):

R: *Thank you Keith, what are your hobbies?*

K: *A HAMBURGER.*

R: *A hamburger that's.*

K: *PIZZA.*

R: *Oh a hamburger and pizza, that's one of your hobbies?*

K: *{grunts} A HAMBURGER.*

R: *Umm.*

K: A HOT DOG

R: And a hot dog, those are your hobbies?

During this interaction, it was perceived that Keith was asked questions that were appropriate, receiving an average rating of 1.65 by the communicative competence judges. When asked to discuss his hobbies he began listing food items that created a communication breakdown. Keith did not use a transitional statement or question or make any nonverbal acknowledgement to his communication partner about the rationale of his response or desire to change the topic. His communication partner was left to infer that perhaps one of Keith's hobbies was going out to eat, but Keith did not confirmed this. Although Keith's specific AAC system contained a large vocabulary, he was perceived as having a somewhat limited vocabulary during this interaction. Keith was also perceived to be a more passive communicator rather than taking on active role in the conversation. He received an average score of 2.20 on the statement "The AAC user took an active part in the conversation". Contrast Keith's abilities to take an active role in the conversation and use more appropriate vocabulary in order to maintain a more cohesive conversation of his pre-intervention interview to that of the following post-intervention interview:

R: Do you have any brothers or sisters?

K: KIM XXX IS MY SISTER.

R: Kim is your sister.

R: Is Kim older?

K: Naw {points to himself}.

R: You're older {points to participant}.

R: Kim is your younger sister.

K: WHERE IS YOUR FAVORITE PLACE TO VISIT OR TRAVEL?

R: Mmm, thank you for that question we're gonna wait until it's your turn,

I'm gonna ask you a few more questions first.

K: {rubs his hands together in excitement while smiling}.

R: Thank you for that question, ok, I like to travel all over the world.

R: I like to see new places and I like to travel a lot.

K: {makes a grumbling sound of acknowledgement}.

During his post-intervention interview, Keith spent much more of his conversational turns staying on the same topic as his communication partner. This could be why he was perceived to have a more active part in the conversation by the communicative competence judges, receiving an average score of 1.60. Even though he was being interviewed, he spontaneously began asking questions about his communication partner and transitioning into the role of the interviewer. This spontaneous transition could be the reason that the communicative competence judges rated him as having more of a desire to communicate, average score of 1.55 compared to the pre-intervention session average score of 2.30. The social experience of engaging in intervention targeting partner-focused may have contributed to the perceived improvement of Keith's ability to take a more active role in a conversation with an unfamiliar communication partner as he had opportunities to practice conversations with guidance. Keith's may have been perceived as having an increased desire to communicate due to the feedback he provided his communication partner. During the post intervention session, Keith responded to his partners questions, which gave her feedback that he was engaged and interested in information she had to share that in turn made the entire interaction more cohesive. In the provided excerpt, Keith used a partner-focused question to change the topic of conversation. However, he did not always use a partner-focused question, at times he would use a statement or a general question to

change the topic. Although Keith only increased his use of partner-focused questions by six questions, it was perceived by the judges that he improved his active participation in conversation, use of appropriate vocabulary, and overall communication rate through participation in this study.

While Keith was perceived as having developed a variety of skills he did not increase his perceived competence in being direct and to the point. Another participant, John, increased his overall ability to be more direct in his communication interactions as judged by third-party viewers. During his pre-intervention assessment, John only received scores that indicated an area of needed improvement (neutral or false) in 3 areas. Two of these areas included the sociolinguistic skills of maintaining an appropriate rate of communication and using a vocabulary that is not too limited. One particular challenge for some AAC users is the development and use of both formal and informal language. This use of informal language in a more formal context or vice versa may result in communication breakdowns. When an AAC user has a system that is primarily based on iconic representations, he or she is more likely to generate one-word or one-sequence utterances (Beukelman & Mirenda, 2005; Binger & Light, 2008). This type of message generation could result in the use of a more informal language conversation style. However, some AAC users who have strong literacy skills and prefer to rely on printed words or spelling as their primary mode of message creation on their AAC system sometimes have difficulty with word selection and their spoken communication appears more like written language. John often chose spelling as his primary means of message generation and occasionally used preprogrammed words that were in print form without a matching iconic representation. This reliance on spelling may have contributed to the

perception of his having a limited vocabulary during the pre-intervention session where he received an average score of 3.93 (neutral to more false than true) by the communicative competence judges. The method of spelling may have also impacted the perceived rate of communication negatively by the judges resulting in an average score of 3.55, indicating that the AAC user did not have an appropriate rate of communication.

John frequently attempted to use formal and syntactically complex sentences when answering questions asked by an unfamiliar communication partner. Although this demonstrated a high level of linguistic complexity, John's rate of communication was slow as he spelled his messages. He did not have the sociolinguistic skills to use the expected language style, spoken language compared to written language, in order to engage in a cohesive conversation. Although his language abilities were strong, his overall participation outcomes were limited due to his decreased rate of communication and vocabulary use. John used a formal language structure, which given the location and purpose of the interview, made the overall communication interaction awkward for the unfamiliar communication partner. During John's (J) pre-intervention assessment with an unfamiliar communication partner (R), he demonstrated language use that caused him to be perceived as having a limited vocabulary and inappropriate rate of communication:

R: *Do you have any brothers or sisters?*
J: *ONE KIND OF.*
R: *One kind of?*
R: *What do you mean?*
R: *A brother or a sister?*
J: *ONE KIND OF SISTER.*
R: *One kind of sister?*
R: *What do ya mean by kind of?*

J: *ONE KIND OF SISTER SHE IS ALSO MY AUNT*

R: *Oh ok but it is kind of like it takes on a role of a sister?*

J: *{nods}.*

R: *that's cool.*

R: *Do you have any pets?*

J: *A YORKIE NAMED MUFFIN.*

Through this interaction, John demonstrated his ability to take an active role in the conversation as perceived by the communicative competence judges, receiving an average score of 1.60. However, the judges indicated that there was some difficulty, average score of 2.25, with his ability to get "right to the point". This is evidenced in John's use of the phrase "kind of" without elaboration. He needed several repetitions of requests for clarification to expand on what was meant by "kind of". At the end of the discussion about his brothers and sisters, the unfamiliar communication attempted to provide rationale for the use of "kind of" by John to repair the conversation and move on to a new topic. It was later learned that John was using "kind of" because his grandparents adopted him, which explained why his aunt would also be his sister. This communication breakdown may have resulted in the perception of having a limited vocabulary. John did not make an attempt to define what was meant by "kind of" but rather moved the conversation forward. He did provide specific information related to his dog by stating the breed of the dog as well as her name. John typically responded to questions using phrases or complete sentences. At times, more concise responses were warranted. It may have been the completeness of the responses provided by John that resulted in the perceived "inappropriateness" of the rate of conversation, receiving a score of 3.55. For example, when asked what he liked to do on the weekends, John responded with "*I USUALLY EAT AT JASON'S DALLY"*. In this situation a shorter

response such as "eat out" would have been appropriate, which then would have allowed the communication partner to request more details if interested.

When in the role of the interviewer, John structured his language appropriately, but used a more formal language style, one that was more characteristic of written language rather than oral language. The use of this formal language style may have contributed to the perception of having an inappropriate rate of communication by the communicative competence judges. Even though John's system allowed him to access some pre-programmed words, he chose to spell out each word and use the word predication capabilities of his system 90% of the time. The use of spelling as his primary means of message creation may have resulted in the perception of having limited vocabulary by the communicative competence judges. While conducting his interview, John began creating his next question as his communication partner was answering the question before. He did not ask any follow-up questions, or make statements about his communication partner's answers. He indicated his awareness of the slowness of his message creation by stating "*I KNOW IT TAKES ME A LONG TIME TO TALK*." The linguistic complexity of John's sentences and questions demonstrated good overall linguistic skills, however he was perceived as having reduced sociolinguistic skills in the areas of vocabulary and rate of communication during his pre-intervention assessment.

After the group intervention process, John improved in the sociolinguisitc areas of vocabulary and communication rate as perceived by the communicative competence judges. Through the combination of these two skills, John was also perceived as having a better communicative strategy in order to get directly to the point of conversation. During his pre-intervention assessment he received an average score of 2.25 for the

statement “The AAC user got right to the point”, compared to 1.85 following intervention. John programmed in several “starter” questions that could be used when engaged in a conversation with both familiar and unfamiliar communication partners. His access to one question using only one button on his AAC system sped up his overall communication engagement with his communication partner. He also created a page within his AAC system that contained all of the question words and phrases that were provided during the pre-intervention assessment (See Appendix F). He was able to maintain use of grammatically correct questions, but could produce them at a rate that was more conducive to a cohesive conversation with his communication partner. Beyond the refinement of his topic initiation strategies he also developed the ability to extend a conversation to make it more cohesive and show a greater interest in his communication partner. This sociorelational skill, demonstrating an interest in gaining information about the communication partner, question 2 on the communicative competence questionnaire was perceived as being slightly improved from pre-intervention assessment with an average of 1.50, to post-intervention assessment with an average of 1.43 by the third party communicative competence judges. He did this through the use of follow-up questions or statements about the information that was provided by his communication partner. An excerpt from his post-assessment role as the interviewer demonstrates his increased elaboration techniques:

J: *DO YOU HAVE ANY PETS?*

R: *Good question.*

R: *Umm, I live in Tulsa, and in Tulsa I don’t have any pets.*

R: *But at home with my parents we have 1 dog and um she’s an Australian shepard.*

R: *She’s kinda like a sheep dog.*

R: She's really pretty.

R: She's kinda bad behaved, but she's really pretty.

R: So yeah, I have 1 dog back home with my parents

R: That was a good question

J: DO YOU M I S MISS H O HOME.

J: DO YOU MISS HOME?

R: {laughs} I do.

John's use of buttons on his AAC system that he programmed to speak either an entire question at once or a question phrase provided the opportunity for quicker communication overall. He demonstrated an increase in his sociolinguistic skills based on his flexibility with formal, informal language, and appropriate vocabulary used based on the specific context within which he was communicating. The availability and use of pre-programmed questions may have contributed to John being able to maintain more casual conversation and a less formal interaction with his communication partner. Although John used multiple partner-focused questions prior to receiving group intervention, his participation in the group intervention may have increased his sociolinguistic skills, specifically refining his skills of producing an appropriate rate of communication and accessing a variety of vocabulary while engaged in conversation with an unfamiliar communication partner. John was viewed as having more communicative competence by the third party judges following his participation in this study.

Sociorelational Skills. A second factor related to interactions in conversation is the presence of sociorelational skills. Examples of specific sociorelational skills include the ability to maintain a positive self-image, demonstrate an interest in others, be an active participant in conversations, and being responsive to a communication partner. Sociorelational skills are heavily dependent on the purpose of the conversation from the

perspective of the AAC user. Most AAC users are adept at using communicative interactions to get their wants and needs met (Beukelman & Mirenda, 2005; Rackensperger et al., 2005; McCarthy et al., 2007; Sutton et al., 2002; Light, 2003; Blockberger & Sutton, 2003). However, they frequently have difficulty in being other-oriented toward their communication partner(s) (Light, 1989). The ability to be other-oriented provides AAC users with the opportunity to enrich their relationships with others. However, research has shown that AAC users can participate in social communication but often express social isolation due to difficulties in establishing social relationships with unfamiliar communication partners (Rackensperger et al., 2005, McCarthy et al., 2007). The difficulties with forming social relationships could be a result of the difficulty with being other-orientation. This study aimed to teach AAC users to be other-oriented through the use of partner-focused questions. Third party communicative competence judges were asked to rate the AAC user participants competence on four specific questions that relate to sociorelational skills. They were questions 2, 5, 6, and 8 (See Appendix I).

One specific sociorelational skill that improved in five out of the six AAC participants was that of demonstrating an interest in getting to know his or her communication partner. This particular skill was the most improved social communication skill for Jared. During his pre-intervention assessment, Jared was perceived to be an active participant during the communicative interaction by the communicative competence judges, receiving an average rating of 1.45. The skill in which Jared was rated least effective in terms of sociorelational communication was that of encouraging elaboration on a topic introduced by his communication partner receiving

and average score of 2.53. Throughout the pre-intervention interaction he sought only information that was relevant to his personal life experiences rather than taking the background and interests of his communication partner into consideration. He did not attend to his partners interests or respond to her comments, and therefore was perceived to have limited interest in getting to know information about his partner. An excerpt from the pre-intervention assessment is provided in which Jared (Ja) had the role of the interviewer and the unfamiliar communication partner (R) was the interviewee:

Ja: *Y O U A H A V E C O M P U T E DO YOU HAVE A COMPUTER?*

R: *Do I have a computer?*

R: *I do have a computer.*

R: *I have a laptop computer so I can bring it to school or take it home.*

R: *What else do you want to know about me Jared?*

Ja: *{holds up finger and vocalizes}.*

R: *That was a really good question.*

Ja: *{points to the question word list}.*

R: *okay.*

Ja: *D A H A V E A E A M A DO YOU HAVE A EMAIL?*

R: *I do have an email.*

R: *That's how a lot of our professors send out our notes for our tests and stuff.*

Ja: *{points to himself}.*

R: *Yeah, I use my email a lot to compute, um to communicate with my friends and family.*

Ja: *{vocalizes and points to himself}.*

R: *You do too?*

Ja: *{nods head}.*

During this interaction, Jared was perceived as having the sociorelational skills of wanting to communicate and interact with his communication partner by the

communicative competence judges. He also took on an active role in the conversation as scored by the judges with an average of 1.45. However, he showed some interest in getting to know about his communication partner as indicated by the judges scores, but the information he sought was specifically relevant to himself. Although he used partner-focused questions, which would typically be represented as being other-oriented, he requested information about his interests and hobbies instead of learning about the interests and hobbies of his communication partner. He did not make an attempt to learn about interests that he and his communication partner had in common.

During the group intervention sessions, Jared was given the social experience of practicing effective sociorelational skills, specifically in regard to demonstrating an interest in getting to know his communication partner. For example, Jared was able to watch video recordings of previous sessions with coaching in being other-oriented specifically regarding when partner-focused questions could have been used, and then he practiced the exchanges that were pointed out when a communication breakdown occurred. During these exchanges, he would wait for his communication partner to let him know she was ready to talk, and he would frequently use the partner-focused question that was missed from the video recording.

Following group intervention, Jared exhibited greater sociorelational skills, especially related to gaining information about his communication partner during his post-interview session. Jared used a variety of question words using the word list as a guide when interviewing the unfamiliar communication partner. He demonstrated his desire to learn about his communication partner through the exploration of materials she brought to the interview session. He often formulated a question and then looked at his

communication partner and waited for a response. His frequent change of eye gaze to his communication partner could be interpreted as a desire to maintain a positive rapport with his communication partner by providing her with encouragement and positive feedback. Contrast Jared's pre-intervention assessment interview to that of his post-intervention assessment in terms of his interest in gaining information about his partner during the interaction:

Ja: *W {laughs and points to ear and makes ok sign with hand} H O O P I WHO PICTURE? {looks at partner}*

R: *Which one?*

Ja: *{points to a picture on the table and looks back at partner}.*

R: *You wanna know whose in that picture?*

Ja: *uh huh.*

R: *There are a lot of girls in this picture aren't there Jared?*

Ja: *{smiles} Yeah.*

R: *Can you find me?*

Ja: *{points to someone in the picture}.*

R: *Umm hmm this is me and these four girls are close friends of mine from undergraduate.*

Ja: *{smiles and laughs}.*

R: *{pointing to different faces in the picture} My friend right here she was moving to umm China so it was a goodbye party and the five of us got together in Dallas Texas to say goodbye.*

R: *That's all my friends from college, that was a good question.*

Ja: *W H A P I WHAT PICTURE?*

R: *You talking about a specific one?*

Ja: *{looks at the pictures like he doesn't care which one but then points to one and looks back to the partner}.*

Jared's overall ability to be other-oriented increased from his pre-intervention session to his post-intervention session as indicated by the scoring of the communicative

competence judges. During the post-intervention session, Jared was perceived has having a greater interest in getting to know his communication partner receiving an average score of 1.35, compared to 1.98 during the pre-intervention, session by the communicative competence judges. Although Jared did not elaborate on the conversation through the use of his AAC system, he was perceived to demonstrate interest in what his communication partner said and made attempts to extend the conversation. This was evidenced by an increase in his average score for encourage elaboration by the communicative competence judges from 2.53 to 2.10. Jared was perceived as having improved sociorelational skills on all four questions related to sociorelational skills by the communicative competence judges. Jared increased his overall perceived communicative competence throughout the course of this study with a score of 2.2 prior to intervention and 2.05 in his post-intervention session.

Another participant, Lisa, was also perceived to have an increase in all questions reflecting sociorelational skills during the post-intervention session. Lisa received favorable scoring from the communicative competence judges during her pre-intervention session, which may indicate knowledge of the specific sociorelational skills. Lisa was very engaged with her communication partner during the pre-intervention session. This was evidenced by average score of 1.40 on the statement that the "AAC user was interested in getting to know his or her partner". She was also perceived as demonstrating adequate sociolinguistic skills, as well, specifically being an active communicator which received an average score of 1.35. She actively participated in the conversation by fulfilling obligatory turns and contributing meaningfully during each communicative turn. Lisa did not spontaneously seek out information about her

unfamiliar communication partner when given the opportunity; instead verbal or visual cues were needed. Examine a portion of Lisa's (L) role when interviewing the unfamiliar communication partner (R) during the pre-intervention assessment:

R: So now it's your turn that you can interview me.

R: Whatta ya want to know about me?

L: HOW MANY ARE IN YOUR FAMILIES FAMILY?

L: HOW MANY ARE IN YOUR FAMILY?

R: How many people are in my family?

R: There's me, I'm not married and I don't have any kids

R: I have a dog, he's kind of like a kid, but I have one brother and then My parents.

R: So we have a pretty small family.

R: There is one of the members in these pictures is a family member.

R: That one is {points to picture}.

L: {looks at picture and smiles}.

R: Yep, that's a family member you wanna see it better {holds picture up}

R: That's a good question you got a lot of information with one question

L: {looks at picture}.

R: That's my grandmother, we call her granny.

L: {looks at researcher and smiles}.

L: {laughs}.

R: Any other questions you want to find out about me?

L: WHO IS THE GIRL?

R: In this picture?

During this exchange, Lisa was perceived as having a desire to communicate with her partner and a likely interest in gaining information about her communication partner by the third party communicative competence judges. She responded quickly and appropriately when asked question. However, Lisa was not perceived as contributing

equally in the conversation with the unfamiliar communication partner. She did not make any attempts to extend the interaction based on the response provided by the communication partner. Lisa was also perceived as having adequate skills related to sociolinguistics during the pre-intervention session as well. She had access to a large vocabulary, including question words and phrases within her AAC system during the pre-intervention session. Throughout the intervention process, Lisa requested that the targeted question words be programmed into her AAC system so that she could generate them quickly and easily. Her mother helped her with the programming of the buttons in the AAC system. Lisa incorporated many follow-up questions, specifically using the question "why," while being the interviewer during her post-intervention session. The inclusion of preprogrammed buttons as well as the use of follow-up questions positively influenced her perceived sociorelational, sociolinguistic and overall communicative competence. Compare the pre-intervention session above with the excerpt of her post-intervention session below:

L: *WHAT IS YOUR FAVORITE HOLIDAY?*

R: *My favorite holiday is Christmas, I love Christmas, that's my favorite holiday.*

L: *WHY?*

R: *I love to spend time with my family and around Christmas time we bake and have a lot of dinners and we have Christmas dinner at my parents house and I get to spend time with all of my family cause their all back in Arizona, so when I go there I love to umm celebrate the holiday the Christmas holiday with them.*

L: *DO YOU HAVE ANY PETS?*

R: *I do have a pet actually.*

R: *I live on campus at the University of Tulsa, I have an apartment there and we're not allowed to have dogs and we're not allowed to have cats so I have a pet fish.*

L: *{looks puzzled at the examiner}.*

R: *I know, that's my pet while I'm here in Tulsa, he's a beta fish, do you know what a beta fish is?*

L: *{shakes head no}.*

R: *They're really pretty they are about this big {shows length with her fingers} and they have all these different colors on them and his name is Pepe, Pepe the fish.*

L: *{smiles at examiner}.*

R: *and I had him out in Arizona and when I moved to Tulsa, he's traveled in a little cup all the way across the states to Tulsa, so that's my pet Pepe, Pepe the fish.*

L: *HOW MANY PEOPLE ARE IN YOUR FAMILY?*

Lisa's post intervention scores from the communicative judges reflect improved sociorelational, sociolinguistic, and overall communicative competence. In particular, she increased her ability to encourage elaboration on a topic of choice by her communication partner receiving an average score of 1.55 during the post-intervention session compared to 1.70 from the pre-intervention session. Another specific area that Lisa was perceived as having more sociorelational competence was in her desire and ability to contribute equally to the interaction as her communication partner. During the pre-intervention session, Lisa received a score of 2.10 on the statement "The AAC user and his or her communication partner took part equally in the conversation (neither dominated)". Following intervention, Lisa lowered this score to 1.68 indicating that the statement was more true from the perception of the communicative competence judges. Lisa's increase of both sociorelational and sociolinguistic skills as perceived by the third

party judges may have contributed to the increase of her perceived overall communicative competence.

One participant, Tara was not perceived as having an increase in any sociorelational or sociolinguistic skills. The only positive increase noted by the judges was that the unfamiliar communication partner asked questions that were appropriate to the AAC user. However, Tara had three skills that were determined to be at least more true than false during both the pre- and post-intervention sessions. Tara was perceived as an active participant in the conversation by the third party communicative competence judges, by receiving an average score of 1.93 and 2.10 pre- and post-intervention on question 1. She was also perceived as having an interest in gaining information about her communication partner as indicated by the averages of question 2 by the communicative competence judges. The final skill that was perceived as true during pre-intervention was that the AAC user seemed to want to communicate. Tara had several medical complications that occurred during her participation in this study. These complications resulted in missing two of the group intervention sessions. It also caused the post-intervention session to occur four weeks following Tara's last participation in group intervention.

Perceived Differences

Changes in the participants' social communication skills both sociolinguistic and sociorelational, may have contributed to them being viewed as having greater communicative competence after the intervention. Four out of the six participants were perceived as having greater communicative competence following intervention. Although there were also four out of six participants who increased the number of

partner-focused questions used during the post-intervention session, it did not correlate to which participants were perceived as being more communicatively competent. However, it does appear that targeting the use of partner-focused questions impacted the overall communicative competence of more than half of the participants. Following group intervention, all six participants received an average communicative competence rating of at least 3.18 indicating at least a neutral viewpoint of being a competence communicator by the competence judges. Therefore, none of the six AAC user participants were perceived as not having some communicative competence by the third party judges.

The findings of this study corroborate the communication patterns of AAC users observed by other researchers (Beukelman & Mirenda, 2005; Rackensperger et al., 2005; McCarthy, et al., 2007, Sutton et al., 2002; Light, 2003; Blockberger & Sutton, 2003; Lund & Light, 2006; Lund & Light, 2007; Lund & Light, 2007a). AAC users tend to use one word or one-hit utterances if it suffices. An AAC user's instinct appears to respond to a question to participate in a conversation, but not extend the conversation. The refinement and development of social communication skills through participation in this study supports the concept that AAC users may not typically have adequate knowledge and practice opportunities with the social nuances of language and the flexibility each social situation demands (Light et al., 1985). This study supports the conclusion that the instruction and practice of using partner-focused questions tends to allow AAC users to be perceived as having more communicative competence.

Other Observations

There were observations made by the researcher during both the pre- and post-intervention sessions that may be of interest relative to communicative competence and social communication. Specifically, these include observations about affect and eye gaze that were not captured with the measures used in the study. There were three participants in particular who demonstrated changes in affect and eye gaze over the course of their participation in the study, Alice, Lisa, and Jared.

Although group intervention was found to be only somewhat effective in teaching the specific skill of using partner-focused questions, the AAC users were able to engage in practice interactions with someone who used their same modality of communication (AAC system, gestures, vocalizations) that may have contributed to the perception of communicative competence. The interactions of the AAC users during intervention, although not formally transcribed, were observed to be more topic focused and elaborative as the group sessions progressed.

During intervention, the use of eye gaze changed for several participants. Alice rarely made attempts to look at her communication partner during her pre-intervention assessment. She would at times, look at her mother before making a comment or request, but did not shift her attention, specifically eye gaze to her unfamiliar communication partner. It was observed that Alice received encouragement and positive feedback from her mother when she showed interest in her communication partner by looking at the photographs provided by the researcher. This feedback may have influenced Alice's shift of eye gaze to her mother rather than the unfamiliar communication partner. During the post-intervention session, Alice frequently shifted her eye gaze from her AAC system to

the unfamiliar communication partner or the photographs provided. She also demonstrated an increase in her emotional reaction to the photographs by laughing at one of the photographs by holding it up and then looking at the unfamiliar communication partner. Alice's use of changing eye gaze and the use of affect may have influenced the communicative competence perception of her overall interest in her communication partner.

Another participant, Lisa asked a question to her communication partner and maintained eye contact throughout the response. She used a multimodal communication approach to express the desire for more information regarding the communication partner's response. She used facial expressions, such as smiling or furrowing her eyebrows to encourage her communication to provide further elaboration. Lisa was also able to recognize the verbal cues her communication partner provided indicating that she shared all of the information she wanted on one topic and spontaneously asked another question, that was somewhat related to the response of the first question, to extend the conversation. These behaviors rather than her use of questions may have influenced the perception of the communicative competence judges about Lisa's communication.

Like Alice and Lisa, Jared had changes there were not measurable by the instrument used in this study. Jared did not provide verbal or nonverbal feedback to his unfamiliar communication partner during the pre-intervention session. He appeared to focus his attention, specifically his eye gaze, on his AAC system rather than changing his gaze to his communication partner. During intervention, Jared initiated interactions with the other AAC user, and frequently changed his eye gaze from his AAC system to his partner's AAC system. Jared would also engage the researcher during the intervention

sessions when he could not find a word or phrase on his own AAC system or on his partner's AAC system. He would use a variety of facial expressions and gestures to indicate he needed help locating or programming words or phrases into the AAC systems. During the post-intervention session, Jared frequently changed his eye gaze from his AAC system to his communication partner and the photographs she brought to the session. He formulated questions then looked at his communication partner and waited for her response. These changes of behaviors may have influenced the communicative competence judges' perception of Jared's social communication skills and overall communicative competence.

Observations related to affect and eye gaze are mentioned as they may have influenced the perceived communicative competence of the AAC users by the third party judges. The differences the AAC users presented in affect and eye gaze were not directly rated by the communicative competence judges, but may have influenced the perception of the overall communicative competence. Affect and eye gaze may have specifically influenced the perception of the third party judges about the AAC users' desire to communicate with others, as well as their ability to demonstrate an interest in the communication partner.

Threats to Internal Validity

There are factors associated with this study that may have impacted the participants' outcomes unrelated to the direct intervention received. Seven major categories exist as threats to internal validity (Phillips, 1971). They include history, maturation, testing, instrumentation, regression, mortality, and selection. In this study the factors of history of speech and language intervention with the users' particular AAC

systems, the instrumentation of the AAC system itself in regard to vocabulary accessibility, as well as testing or practice that was conducted outside of the intervention sessions as initiated by the AAC user or his or her parent or guardian were considered threats to the effectiveness of the intervention alone. At the commencement of the study all but 1 participant had access to question words within his or her AAC system; however, all 6 participants added either question words or entire questions to their AAC systems. This alone could have contributed to the positive results of some of the participants rather than the training they received in asking questions.

The history and involvement of speech and language intervention for the participants varied. Throughout the course of the study, 3 of the participants were active in speech and language intervention with a speech pathologist not associated with this study. The 3 participants, Lisa, John, and Jared all showed an increase in their perceived communicative competence. It is possible that they received additional instruction regarding sociorelational or sociolinguistic skills in intervention outside participation in the group intervention provided in this research study.

All of the 6 AAC user participants added preprogrammed messages to their AAC system throughout the study. The researcher aided in the programming of the 5 targeted questions, but no other programming. One participant, John, created notebooks of questions based on his familiarity with his communication partner outside of his group intervention sessions. Lisa's mother, as well as Alice's mother, also contributed to the programming of vocabulary, phrases, and questions on their daughters' respective AAC system. Neither Keith nor Tara had any programming added to their AAC systems outside of the group intervention sessions and programming done by the researcher.

Neither Tara nor Keith increased their perceived communicative competence which may be a result of the lack of additional vocabulary added to their specific AAC systems by either themselves, a family member, or other interested person. It is unknown the degree, if any, families or care providers provided additional instruction or practice opportunities in between the intervention sessions.

The six AAC users in this study varied in their community involvement. Four of the six AAC users indicated they participated in a variety of activities out of their home environment. For these four participants, there were more opportunities to practice the skills targeted during the group intervention. Specifically, the AAC users could practice asking the newly programmed questions from the group intervention session to a variety of communication partners. Tara, who lived in a group home and attended an adult day center, at times participated in community outings; however, as previously stated she had several medical complications throughout the course of this study. Therefore, she did not have the same opportunities to further practice the skills targeted during group intervention with a variety of communication partners. Keith, who lived with his parents, also had the opportunity to go out into his surrounding community, but his mother reported he did not always take his AAC system with him. This limited his practice abilities as well. The four AAC users who reported going to a variety of places in the community, work, school, church, etc. all increased their overall perceived communicative competence. Therefore, the additional practice may have impacted their overall perceived communicative competence.

CHAPTER V

Summary and Conclusions

The use of partner-focused questions by AAC users with unfamiliar communication partners and their impact on perceived communicative competence of the AAC users was examined. Three main questions were addressed:

1. Do AAC users use partner-focused questions with an unfamiliar communication partner?
2. Is group intervention effective in increasing the use of partner-focused questions with unfamiliar communication partners?
3. Are AAC users who use partner-focused questions viewed as having better communicative competence by a third-party viewer?

There were two AAC users who used at least one-partner focused question with an unfamiliar communication partner prior to receiving group intervention. All of the participants used at least one question, whether it was a general question, a statement or a gesture that was interpreted as a question, prior to receiving group intervention. The participants presented with a variety of social communication abilities during the pre-intervention session.

Group intervention appeared to have some effect on the use of partner-focused questions. Five out of the six AAC user participants used at least one partner-focused question during the pre-intervention session interview. During the pre-intervention session the range of partner-focused questions across participants was 0 to 9. Following intervention, four out of the six AAC users increased the number of partner-focused

questions by at least one question during their post intervention interview. The range of partner-focused questions used during the post-intervention session was 1 to 9.

Five out of the six AAC users were viewed has having better communicative competence following group intervention targeting the use of partner-focused questions. The one participant who was not perceived as having better communicative competence was hospitalized during the study and therefore missed two of the group intervention sessions. The results suggest that for these individuals it was not necessarily the use of partner-focused questions that impacted their perceived communication competence by judges, but rather changes and development of sociolinguistic and sociorelational skills.

Clinically, these findings suggest that language intervention for AAC users that involves practice focusing on others could improve perceived communicative competence and should be considered for AAC users. In addition, the findings point to the importance of having vocabulary to support the expression of an interest in others. Intervention focusing on sociolinguistic and sociorelational skills may best be implemented in a group where guided practice is possible. AAC intervention that includes asking questions as well as responding to them to help reduce asymmetry of the conversation could improve perceived communicative competence.

The findings of this study are limited in that they may not be representative of the entire AAC population. Additional research is needed to determine if these findings are consistent across AAC users who have had an AAC system at least 10 years. Additional research is also needed to expand on current techniques and strategies during language intervention to increase the overall communication competence of AAC users, specifically that of social communication competence. Similar research should be

conducted with children who are younger and participate in more group based educational settings (i.e., centers, group projects, teams) where social interactions are expected and reinforced frequently.

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APPENDIX A

(Examples of dynamic display AAC systems used by AAC participants)

DynaVox V and VMax from Dynavox Technologies Inc.

Vanguard II from Prentke Romich Company

ECO-14 from Prentke Romich Company

Mini-Merc by tobiiATI

APPENDIX B

(AAC participant eligibility questionnaire)

Name of Participant: _____ Date: _____

Name of person completing form: _____

Relation to participant: _____

Names/Description of Augmentative or Alternative Communication (AAC) System:

1. _____
2. _____

Please circle the most correct response.

Primary mode of communication:

Verbal Communication Sign Language AAC System

Highest Level of Education:

Elementary School Middle School High School

Some College Bachelor Degree Some Post-Graduate

Post-Graduate Degree

Current AAC System Used for:

Less than 3 months 3-6 months 6-9 months

9-12 months More than 12 months

Current Speech-Language Intervention:

None individual sessions group sessions

1 time per week 2 times per week more than times per week

Speech-Language Intervention during K-12 Schooling:

None individual sessions group sessions

1 time per week 2 times per week more than times per week

APPENDIX C

Double Interview Procedure

Phase of Double Interview	Description
1—Modeling	The researcher modeled question use to gain information about the participant The unfamiliar communication partner read the explanation and introduction of the activity and answered any questions from the participant or his or her guardian The unfamiliar communication partner used aided input with the participant's device, if possible, to model the use of questions and responses The unfamiliar communication partner modeled the use of the same ten questions with all participants The chosen questions provided an opportunity for diverse responses from the communication partner. Some questions could be answered with a simple yes or no response, while others had the expectation of phrase or sentence level responses The questions were also based on the fact that the responses should be well known to the participants, and therefore, some type of answer was expected to maintain the turn-taking sequence in conversation

	The focus of this phase of the conversation was to provide a model to the participant of asking questions to an unfamiliar conversation partner in order to gain information and to build a social relationship (Winner, 2007)
2— Transition	Used to transition the participant from being the responder to being the questioner Unfamiliar communication partner showed various photographs of herself with a variety of people in a variety of settings The researcher then asked the participant to tell who the people in the picture were, or solicit other information about what was occurring in each photograph If the participant was unable to come to any conclusions regarding the pictures, the researcher provided descriptive information about each one of the three photographs Once all of the photographs were reviewed the Double Interview continued to the third and final phase
3--Interview	The participant is provided the opportunity to use questions to gain information about the unfamiliar communication partner The participant was asked to interview the unfamiliar communication partner An explanation was provided to the participant stating that an interview is when the interviewer asks specific questions to

	an interviewee to gain information The different types of question words or iconic representations were reviewed, and presented on a separate piece of paper The unfamiliar communication partner explained to the participant that the same questions which were used during phase one could be used by the participant The unfamiliar communication partner then waited for the participant to initiate a question If after two minutes, the participant did not generate a question, the researcher pointed to the pictures and stated to the participant that a question could be asked about one of the photographs Two minutes after the prompt was provided, if the participant still had not generated a question, a specific topic was provided to the participant (Winner, 2007) For example, the researcher would say "this is a picture of my brother and I, what can you ask me about my brother?" Once the participant indicated that he or she was done with their interview, the session was concluded

APPENDIX D

Double Interview Questions
(adapted from Michelle Winner's *Thinking about You Thinking about Me*, 2007)

Explanation and Introduction of Activity: The first time you meet someone a good way to get to know more about them is by asking them some questions about themselves. By finding out the answers to the questions you can determine what things you may have in common. It is helpful to ask some general questions when you first meet someone so that you can know what you might be able to talk about the next time you see him or her. I am going to ask you some questions first to get to know you better, then, I will give you the opportunity to ask me some questions so you can get to know me.

1. Do you have any brothers or sisters?

2. Do you have any pets?

3. When is your birthday?

4. What are your hobbies?

5. What is your favorite thing to do at home?

6. What do you like to do on the weekends?

7. What is your least favorite chore?

8. Where is your favorite place to visit or travel?

9. If you could see a movie with anyone, who would it be? Why?

10. If you could do anything you wanted to for one day what would it be?

APPENDIX E

(Photographs used for transition of Double Interview)

APPENDIX F

(Question Words)

Do you

Who

What

When

Where

Why

How

Have you

APPENDIX G

(Double Interview Partner Fidelity Checklist)

Introduction

_____ Explained and read the purpose of the double interview to the participant

Phase One:

_____ Ten partner-focused questions were modeled

_____ The researcher did not reveal any personal information as a reaction to the participant's response

Phase Two:

_____ The researcher presented 3 pictures to the participant pointing out her specific placement within the picture

Phase Three:

_____ A list of question words is place in visual range for the participant with verbal reference to some or all of the words on the list

_____ The participant was verbally informed that she or he may use the same questions that the researcher used during Phase One

_____ The researcher waited for the participant to initiate a question and used the phrase "What else do you want to know about me?" if needed

_____ If after 2 minutes, the participant did not ask a question, the researcher referenced the pictures from phase 2, and stated "what could you ask me about these pictures?" then waited 2 minutes again

_____ If the participant still did not initiate a question, the researcher referenced a specific photograph, and made a statement then prompted a question then waited an additional 2 minutes. For example: This is a picture of my brother, what do you want to know about my brother?

_____ If the participant did not generate a question, or indicated that he or she was done with their interview, the session was concluded

APPENDIX H

(Treatment fidelity Checklist)

Session 1:

_____ The 5 targeted questions were introduced
_____ The participants watched a video demonstrating good and inadequate use of partner-focused questions
_____ The researcher showed each participant through aided input or verbal guidance how to access each of the targeted 5 questions on their individual AAC system
_____ The researcher discussed the importance of asking questions to communication partners

Session 2:
_____ The 5 targeted questions were reviewed
_____ The researcher showed each participant through aided input or verbal guidance how to access each of the targeted 5 questions on their individual AAC system
_____ Each AAC user was guided through asking and answering the targeted questions with another AAC user

Session 3:
_____ The AAC users watched a short video from their previous session of practicing asking and answering with an AAC user
_____ The researcher reviewed where communication breakdowns occurred
_____ The researcher discussed the importance of asking questions to communication partners
_____ Each AAC user had guided practice asking and answering the targeted questions with a verbal communication partner, the researcher using supports of aided input or verbal guidance of how to locate the target questions

Session 4:
_____ The AAC users watched a short video from their previous session of practicing asking and answering questions with a verbal communicator
_____ The AAC user practiced interviewing a familiar communication partner, the researcher, with only verbal cues of key words to ask questions provided

APPENDIX I

(Communicative Competence Questionnaire)
(Adapted from Bedrosian et al., 1992)

Instructions: You have just observed a video recorded interview between a verbal communicator and an AAC user. On the basis of your observation, please circle the number (explained below) that best corresponds to your impression of the AAC user's role during the conversation. Please answer every question even though you may feel uncertain about the best response.

5=Definitely False
4=More False than True
3=Neutral
2=More True than False
1=Definitely True

1. The AAC user took an active part in the conversation.	1	2	3	4	5
2. The AAC user was interested in getting to know his/her partner	1	2	3	4	5
3. The AAC user was asked questions that were appropriate.	1	2	3	4	5
4. The AAC user's vocabulary was too limited to convey his ideas or feelings.	1	2	3	4	5
5. The AAC user encouraged elaborations about topics introduced by his partner	1	2	3	4	5
6. The AAC user seemed to want to communicate	1	2	3	4	5
7. The AAC user's rate of communication was just right (neither too fast nor too slow)	1	2	3	4	5
8. The AAC user and his/her communication partner took part equally in the conversation (neither dominated)	1	2	3	4	5
9. The AAC user got right to the point.	1	2	3	4	5
10. The AAC user seemed to be a competent communicator	1	2	3	4	5