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# Speaking my Language: Nurturing Augmentative and Alternative Communication Use Across Settings and Communication Partners in Early Childhood

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Settings and Communication Partners in Early Childhood

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### Abstract

This paper explores literature on the topic of Augmentative and Alternative Communication (AAC) across settings and partners used by children who have Complex Communication Needs (CCN). Children learning speech are often able to develop expressive and receptive language skills due to exposure to many speech models and rich language interactions. Both the quality and quantity of these interactions help typical children develop language skills rapidly (Sennott, Light, and McNaughton, 2016). However, for children who use AAC, modeling is much harder to access. Sennott et al. (2016) found that AAC users see or hear about 24,000 words modeled for them (a high estimate) compared to 125,000 words per week for speaking children. Because AAC communicators often lag behind their peers in terms of acquired expressive and receptive language, it is imperative that conversation partners create as much space as possible for these learners to express themselves, whether during interventions or spontaneous conversations, inside or outside of the classroom. For AAC users, an asymmetry often exists between the modalities of input to output. In other words, it is common that an AAC speaker's ways of expressing language and ways of receiving language often do not match. Studies included in this paper demonstrate that, with the appropriate models of AAC within naturalistic contexts, used with various interaction techniques, the users made gains in both expressive and receptive language. When provided with the right instruction and adequate models, children with CCN can develop flexible language skills (Sennott et al., 2016).

## Speaking my Language: Nurturing Augmentative and Alternative Communication Use Across Settings and Communication Partners in Early Childhood

Visuals and gestures have been used as communication aids and supplements for a long time. However, people who do not speak verbally become dependent upon these visuals and gestures as their primary form of communication, not just as optional additions. Augmentative and Alternative Communication (AAC) is way of communicating visually, in a verbal world. Individuals, who cannot communicate verbally because of a disability, often utilize this type of communication in one of a variety of ways. When AAC is needed daily for every interaction between a child and his or her parents, teachers, or peers, for every function of language, it is imperative that it be used to the fullest extent. This literature review will explore how AAC use is, and has been, nurtured across settings and communication partners in early childhood for the benefit of children with Complex Communication Needs (CCN).

### **Literature Review**

#### **Typical Children**

As children age, they experience oral language development. This is the expansion of both one's speaking skills, or expressive language, and their listening skills, also known as receptive language (Steen, 2016/2017). Eventually, verbal individuals develop oral language skills to the point where these skills are automatic and can be used without thinking. When children do not have to focus their efforts on producing words, communication becomes richer because they are able to pay attention to the environment, the speaker, or the topic instead (Halloran and Halloran, 2006). Children learning speech are often able grow their communicative abilities due to exposure to many speech models and rich language interactions.

Both the quality and quantity of these interactions help typical children develop language skills rapidly (Sennott et al., 2016).

Researchers have a variety of ways to express this quantity of language modeling that typically developing children receive throughout their early childhood years. Hart and Risley (as cited in Sennott et al., 2016) found that a typical child will “hear approximately 26 million words between birth and age four” (p. 2). Korsten stated, (as cited in Center for Technology and Disability, n.d.) “The average 18 month old has been exposed to 4380 hours of spoken language at a rate of eight hours per day from birth.” Yet these children are not expected to be fluent speakers by that age. These numbers are astounding considering this is purely modeled language, not direct teaching, and is often done without conscious effort.

### **Key Concepts and Terms**

In some children, oral language development and exposure does not reflect that of typical children. Beukelman and Mirenda (as cited in Sennott et al., 2016) stated that children with disabilities such as autism spectrum disorder, cerebral palsy, and other disabilities often have Complex Communication Needs (CCN), meaning that they do not have the ability to meet their own needs using verbal speech. There is a staggering gap in language modeling from these children to children who are, or will, speak verbally. Children with CCN often require Augmentative and Alternative Communication, which includes multiple methods for communication, such as pictures, speech-generating devices (SGD), writings, signs, and gestures. Because these methods of communication are not often readily available, children with CCN ordinarily do not receive as much language exposure. Korsten reflected (as cited in Center for Technology and Disability, n.d.) on this discrepancy by stating, “If AAC learners only see symbols modeled for communication twice weekly for 20-30 minutes, it will take 84 years for

them to have the same exposure to aided language as an eighteen month old has to spoken language.” Sennott, et al. (2016) found that AAC users see or hear about 24,000 words modeled for them (a high estimate) compared to 125,000 words per week for speaking children. Even the largest dosage of AAC reported pales in comparison with the input that speaking children hear.

Due to this discrepancy between language input for oral speakers and input for AAC users, it is imperative that AAC modeling be increased and used with the same commitment as oral language modeling. To better understand the need for AAC for communicators with CCN, it is necessary to define the terms associated with it (See appendices A and B). AAC can mean methods of communicating that are augmentative, and can be added to natural speech or writing, or are an alternative to spoken communication or writing, including pictures, speech-generating devices, writings, signs, gestures, speech and vocalizations (Baxter, Enderby, Evans, and Judge, 2011). The category of AAC can be further subdivided into two categories, Aided Language Stimulation (ALgS) and unaided technology systems. ALgS shows oral speech and language represented on a communication aid (Dodd and Gorey, 2013). Unaided systems use a way of communicating that does not require any equipment (Agius and Vance, 2016). From here, aided systems can be split into high- and low-technology options. High-technology systems provide a voice or written output to communicate. This is often in the form of a Voice Output Communication Aid (VOCA), a speech-generating device, or software on a personal computer used as a communication device (Baxter et al., 2011). Low-technology systems are another method of ALgS that are non-powered and often handmade. A few examples of these are communication books or boards, written words, photos, or drawings (Baxter et al., 2011). Another example that could be high- or low-technology depending upon the way it is used is the Picture Exchange Communication System (PECS). Within this system, the user is taught to

communicate by exchanging a symbol with a communication partner. This can be a low-technology system if the user exchanges a physical picture or carries a book of pictures. It can also be a high-technology system if it is used in the form of a speech-generating device (SGD) that provides voice output (Agius and Vance, 2016).

No matter what type of system a person uses, the vocabulary within it can be composed of core vocabulary, fringe vocabulary, or a mix of both. Core vocabulary words are words that make up a large portion of daily communication and can be used in multiple instances and situations. These are words that can be used alone or in phrases for a range of communicative functions (Dodd and Gorey, 2013). In contrast to core vocabulary words are fringe vocabulary words. Hill and Romich (as cited in Dodd and Gorey, 2013) stated that these are context specific words that are relevant to an individual's interests and environment.

### **Types of AAC and Perspectives on Its Use**

There are several perspectives on how AAC should be utilized inside and outside of the classroom. One way is through intervention. Schlosser, Koul and Costello (as cited in Dodd and Gorey, 2013) stated that an intervention is a series of intentional steps taken toward a goal. Interventions are often prescribed in a dosage, which is the "amount of time that an individual child must engage and participate in early childhood intervention program[s] or service[s] to show measurable, functional progress" stated by Suen and Fevola (as cited in Kuhn and Marvin, 2016, p. 22). Early childhood educators, special education teachers, speech and language pathologists, occupational therapists, or others on the child's Individualized Education Plan (IEP) team often teach or lead these interventions.

The way adults approach the use of AAC during interventions can affect the child's use or understanding. Bae (2012) describes spacious and narrow interactional patterns that influence

AAC acquisition. Research often takes the perspective of adults for granted, seeing children primarily as objects that need altering or changing. Spacious patterns are open, full of freedom to express oneself, and include space to make mistakes in conversations. Teachers who teach in a spacious pattern recognize their student as a mutual partner of equal worth and are able to shift from their perspective to their student's perspective. This confirms the right of the AAC speaker to have his or her own experience (Bae, 2012). By contrast, narrow interactional patterns are constricted and offer less vitality. Here, the teacher seeks control of interactions and how conversations develop. The intent of these interactions is often: conversations, practical cooperation, playfulness or humor, and setting of limits. Adults in this setting are often evaluators or correctors and children are perceived as the receivers of language (Bae, 2012). This is to say that when a teacher operates in a narrow pattern, "the teacher creates a narrower space for what she herself gets back from the children with regard for their thoughts and feelings" (Bae, 2012, p. 65). These conversations often end with withdrawal on the part of the child. "Communicational acts of both partners influence the quality of the interaction" (Bae, 2012, p. 56). Therefore, the space and grace in communicational acts sets the tone for the quality.

Another type of AAC use that could be utilized during interventions is the Language Stimulation Technique. This technique is composed of four parts: self-talk on the part of the speaker, parallel talk to internalize the dialogue, modeling to give an example of meaningful production, and expansion of the AAC speaker's utterances (Dodd and Gorey, 2013). This method of intervention is especially beneficial on SGD and can positively impact those who exhibit a low initiation rate in communication. It is easy to miss communication attempts when using a non-voice generating system. As the listener, failing to respond is a missed opportunity to reinforce the AAC speaker and may decrease the likelihood of future interactions (Dodd and

Gorey, 2013). Other advantages to tablets as SGD include their relatively low cost, their mainstream appeal and their portability compared other SGD (Agius and Vance, 2016).

Another perspective on AAC use is to take a developmental approach to vocabulary. Dodd and Gorey (2013) suggest that this will provide the AAC speaker with the means to communicate for a variety of communicative functions. This allows AAC users to say more than just answers to questions or to make requests. To achieve this type of communication, it is imperative that each word be individually represented in its own picture, symbol, drawing, or word (Dodd and Gorey, 2013).

Because AAC communicators are often lag behind their peers in terms of acquired expressive and receptive language, it is imperative that teachers and others create as much space as possible for these learners to express themselves, whether during interventions or spontaneous conversations.

### **Need for More AAC Use**

The need for more AAC use is due to many factors. First, for AAC users, an asymmetry often exists between the modalities of input to output. Smith and Grove (as cited in Sennot et al., 2016) noted that these speakers receive language input in a different modality (such as verbal speaking) than the AAC system that they use to express themselves. In other words, it is common that an AAC speaker's ways of expressing language and ways of receiving language do not match. This requires the user to use code switching: constantly switching from a verbally symbolic language system to a visually symbolic language (Dodd and Gorey, 2013). When a communicator must put effort into code switching during every interaction, less energy can be given to listening or to the topic of the conversation.

The use of AAC can support students who have difficulties with speech production, comprehension, and communication (Chung and Douglas, 2014). There is especially a need for AAC use among the population with autism spectrum disorder. Anderson et al. (as cited in Agius and Vance, 2016) found that as many as 30% of children with a diagnosis of autism spectrum disorder may remain nonverbal, meaning they may produce no, or very few, consistent words vocally. Many studies have also indicated that motor impairments are prevalent in children with autism spectrum disorder, although it is not characterized as a common trait for that disorder in the Diagnostic and Statistical Manual of Mental Disorders 5<sup>th</sup> ed. (DSM-V) (Halloran and Halloran, 2006). Dzuik et al., (as cited in Halloran and Halloran, 2006) also found that poor praxis and dyspraxia were correlated with autism spectrum disorder and social and communicative impairments. The need for more AAC use amongst this population is great due to the accessibility to language that it provides and the predictable nature of its use.

### **How to Increase the Use of AAC**

With increased use and modeling of AAC will come increased fluency in, and comfort with, this type of communication. Agius and Vance (2016) discussed the mastery phases of communication. However, perhaps setting mastery criteria limits success. Beukelman and Mirenda (as cited in Dodd and Gorey, 2013) noted this, too. “Many children with CCN are visual learners living in an auditory world so it is imperative that we enhance their learning potential by capitalizing on their strength” (p. 12). So often, the strength of students with CCN is not mastery. Perhaps leaving space to explore, make mistakes, and grow could lead to increased AAC understanding and use, and eventually mastery.

**AAC with different communication partners.** Kent-Walsh, Murza, Malani, and Binger (2015) found that communication partners often provide few opportunities for communication

because they take the majority of turns and ask a lot of yes/no questions. Johnson, Inglebret, Jones and Ray (as cited in Kent-Walsh et al., 2015) found that this is often cited as a major contributing factor to device abandonment. When communication partners only offer “yes, but...” answers, this can convey the message to the AAC user that their contribution is not good enough and must be expanded upon. Likewise, showering the AAC user with a multitude of enthusiastic praise emphasizes the adult’s position as the evaluator over the importance of AAC user’s contributions. Too much energy then goes into finding the right answer, rather than creating original thoughts (Bae, 2011). Instead, it is important that the communication partner engage the AAC user in a conversation rather than an evaluation session. When the child hears clear, appropriate speech modeled they can begin to hear and imitate the sounds of words (Steen, 2016/ 2017).

The goal of using AAC with a variety of communication partners is to increase the time spent having partners model expressive communication through the child’s AAC system as the partner speaks verbally. This time should not be spent with a target words or phrases in mind but rather should aim for modeling natural and genuine communication and interaction (Sennott et al., 2016). This will provide greater symmetry for the AAC user between their language input and output. “Communication partners modeling AAC as an intervention had been proposed as a way to address this asymmetry” (Sennott et al., 2016, p. 2). Downing (as cited in Chung and Douglas, 2014) found that the most competent communication partners are those who know the child well, who are enthusiastic and informed and who supported the development of long lasting relationships. Teachers tend to be tolerant of mistakes and do not emphasize correctness. Teachers also do not punish or humiliate in front of others if the child makes a mistake (Bae, 2012). Joint involvement in the dialogue also tends to be a focus of teachers. “Hence, it makes

sense to argue that the teacher's focused attention is conducive to child's active participation" (Bae, 2012, p. 61). The importance of partner instruction has long been acknowledged as important in the field of AAC by Cumley, Beukelman, Mirenda, Ia Convo, Williams, Schepis and Reid, (as cited in Kent-Walsh et al., 2015). Caregivers, educational assistants, parents, peers, and teachers can all take part in communication partner interventions. "Provision of instruction should be routinely provided unless there is clear evidence that typical partners in a full range of environments are regularly demonstrating the skills needed for a successful interaction" (Kent-Walsh et al., 2015, p. 280). Creating an intervention plan that includes partner instruction within AAC intervention will likely assist in building the communication skills of individuals with CCN. This finding validates earlier reports and literature indicating that communication partner instruction is an effective intervention component for those who communicate with individuals with CCN (Kent-Walsh et al., 2015).

Because so many opportunities for children's learning occur between visits from the interventionist, it is imperative that communication partners use their time with the child for modeling and increasing expressive language exposure (Kuhn and Marvin, 2016). Communication partners should use expectant delays to provide the child with plenty of time to respond to questions and statements (Dodd and Gorey, 2013). In the *Communication Prompt Hierarchy*, VanTatenhove (n.d) states that partners should model three times then assist. By modeling first, one does not have expectations right away of what the child should be able to do. Amundsen, Kent-Walsh, Stark and Binger (as cited in Kent-Walsh et al., 2015) found that one drawback to communication partner intervention is that clinicians are often not reimbursed for their work with these partners. Ideally, systems would advocate over policy and procedure barriers that prevent this intervention or reimbursement.

In terms of communicating with peers, children with speech delays or other disabilities often feel isolated and excluded from classroom experiences and interactions with same-age peers (Steen, 2016/ 2017). Several approaches, found by Chung, Carter and Sisco (as cited in Chung and Douglas, 2014) have proven effective in interactions between students who use AAC and their peers without disabilities, including peer training, adult facilitation, team collaboration and single skill teaching. Peers as models help facilitate social skill learning, knowledge acquisition, and develop relationships (Chung and Douglas, 2014). One way to incorporate peers as models is through playgroups, wherein students can build community and listen to speech modeled appropriately. Other opportunities for talking and interaction within the classroom include movement and music activities and reciting poems and finger plays. All children need positive, meaningful, and fun ways to interact with peers, teachers and their environment (Steen, 2016/ 2017). Technology will likely play a big role in these interactions in the future. With the introduction of new mobile technologies readily available and capable of serving as AAC systems, is it likely that communication partners would have easier access and could provide greater amounts of AAC modeling throughout the day (Sennott et al., 2016).

**AAC use in a variety of settings.** “It does not suffice to invite children’s views only at certain times, or at specific decision-making or choice routines. Their right to participate must be taken into consideration in various kinds of everyday activities” (Bae, 2012, p. 54). Downing argues (as cited in Chung and Douglas, 2014) that children who use AAC need to have their voice heard in a variety of settings throughout the day. Active and fluid communicators convey messages to different partners, in a variety of settings, in a motivated and self-determined manner throughout the day. Spacious patterns in the Least Restrictive Environment (LRE) allow for voices to be heard (Bae, 2012). Communication teams must identify natural environments

where communication opportunities are abundant and may be prompted and observed. These may include daily routines and activities that the child already participates in. That time can be used to refine and target behaviors and skills in meaningful ways (Kuhn and Marvin, 2016). Using these strategies within the natural environment provides the dosage of needed intervention that helps develop meaningful and functional communication improvements in children (Kuhn and Marvin, 2016). Time spent in the general education setting is important, too. This time allows for incidental and imitative learning not always found in self-contained classrooms. In self-contained classrooms, special education teachers often have simultaneous teaching responsibilities to several other children of a variety of grades and ages. Moreover, Jackson and Ryndak (as cited in Kleinert, Towles-Reeves, Quenemoen, Thurlow, Fluegge, Weseman and Kerbel, 2015) argue that the general education classroom may be the most appropriate setting for students who use AAC because access to the grade-level content means both *what* and *how* that content is taught. General education teachers are able to provide the content and teaching style not found in self-contained classrooms. “Can we speak of full access to that curriculum for students with the most significant cognitive disabilities if they are taught largely or even totally apart from the presence of students without disabilities” (Kleinert, et al., 2015, p. 323)? To be most effective, Dada and Alant (as cited in Dodd and Gorey, 2013) recommended that ALgS be applied to 70% of interactions or interaction opportunities throughout a child’s day. Therefore, it is imperative that the setting a child is in is benefitting him or nurturing that communication for well over half of the day. However, this does not always happen. Chung and Douglas (2014) studied sixteen students with intellectual disabilities and/or autism spectrum disorder who used AAC. These children were observed four times in the general education classroom. It was reported in Chung, Carter and Sisco (as cited in Kleinrt et al., 2015) that these children did not

have access to their AAC devices or preferred methods of communication for over half the class period. Kleinert et al., (2015) also observed a negative relationship between the presence of AAC use and the placement of children in less restrictive settings and noted that it was a finding of concern. The results of this study support the need for practitioners and IEP teams to more thoroughly understand the LRE for students with CCN and significant cognitive disabilities and to implement it. With more exposure to the material comes more comfort that the child will have with it (Steen, 2016/ 2017).

**Motor plan.** When using AAC, such as a speech-generating device, automaticity must be possible. In verbal speech, automaticity is achieved through both a consistent sensory input and consistent motor plan (Halloran and Halloran, 2006). The motor plan to say a word verbally remains consistent across time, developmental levels, and all environments. The motor plan to say a particular word must be different from the motor plan to say all other words (Halloran and Halloran, 2006). “Motor automaticity is achieved through practice when a consistent motor movement produces a consistent result. In order to achieve automaticity with AAC, each word should be accessed using a unique and consistent motor pattern regardless of the activity” (Halloran and Halloran, 2006, p. 17). After the placement and motor movement of a word has been established, it should not be changed, as this would negatively affect communication fluency. A specific motor plan on a device allows different access to language than a motor plan for verbal speech. Halloran and Halloran (2006) found that individuals with autism spectrum disorder might experience difficulties with motor planning of an icon on a device. However, this motor plan is often easier for these individuals than the motor plan for the articulation of a word.

## **Results**

Many studies resulted in increased positive effects of AAC use for students with CCN, in the areas of pragmatics, semantics, syntax, and morphological development for young, beginning communicators. Sennott et al. (2016) found that there were “large and clinically relevant effects on beginning language skills of individuals with CCN using AAC” (p. 5). In ten studies, it was noted that children had: increased communication terms, gained vocabulary knowledge for small sets of target words that were mostly nouns, communicated increased multiple symbol utterances and demonstrated knowledge of early morphological forms (Sennott et al., 2016). These studies demonstrate that, with the appropriate models of AAC within naturalistic contexts, used with various interaction techniques, the users made gains in both expressive and receptive language. When provided with the right intervention, children with CCN can develop these flexible language skills (Sennott et al., 2016). Kleinert et al. (2015) found AAC to be underutilized especially for those students who have the highest need or the most limited communication competence.

Success was also found in a variety of different types of devices. Agius and Vance (2016) studied three boys who were exposed to two different devices: Fred, Larry, and Elias. Fred had one independent request using PECS out of seven sessions and no independent requests with the iPad. Fred chose PECS on 21 occasions and the iPad on four occasions. Larry had no independent requests with either system. He began to imitate the digitized speech that he heard from the iPad. He chose the iPad and made more spontaneous speech requests with it than with PECS. Elias had no independent requests because he did not reach towards a communication partner when trying to use the iPad. Elias could eventually use PECS with a 100% success rate. Agius and Vance (2016) found that both of the AAC options used in their study, PECS and the iPad, were equally effective. However, PECS was acquired at a faster rate because handling the

iPads was a prerequisite that made it harder for the children to access language. This suggests that both SGD and PECS are appropriate for developing initial requesting skills. “A number of studies have also utilized SGD as a communication device and have documented increased communication effectiveness as a result” (Agius and Vance, 2016, p. 58). Preschoolers with autism spectrum disorder can be taught advanced operations on an iPad, including navigation, which can lead to teaching how to use the iPad for requesting (Agius and Vance, 2016).

Results were also found regarding the relationship between settings and AAC use. Kleinert et al. (2015) found that there was a positive relationship between more inclusive environments and more expressive communication. Positive relationships between inclusive environments and both reading and math skills were also found. A negative relationship was found between inclusive settings and the amount that AAC is used, meaning that the more individualized the setting, the more often AAC is found to be used.

Spacious and narrow patterns also have an impact on student success. In spacious interactions, children tended to ask questions and be active in their curiosity instead of being at the receiving end of a teacher’s closed questioning. Children and teachers also tended to be playful which created more of an equal relationship. These relational experiences supported the importance of a child’s participatory rights and recognized children in their experiential world (Bae, 2012). This spacious pattern is not focused on specific communicational techniques, programs or instruments. Instead, this is a shift towards recognizing and respecting children’s experiences, including having “the ability to take the perspective of the other and a willingness to change position” (Bae, 2012, p. 67).

## **Limitations**

There are many limitations to this research on AAC use across settings and communication partners. First, only children have been studied, not adults, and only those individuals with complex, instead of advanced needs (Sennott et al., 2016). This limits the generalizations that can be concluded about entire populations of people with CCN. Also, the various components of interventions must be broken down and further studied to see what effect, if any, these components have on AAC use (Sennott, et al., 2016). Agius and Vance (2016) described some limitations in their work with iPads during AAC intervention. During the baseline all three participants chose the iPad more often than the PECS book. This may be due to having previous experience with tablets at home. In the iPad condition, which was an adapted PECS protocol, participants had to reach towards the communication partner with the iPad before activating a symbol. When the AAC application was on and open, participants were limited by only being able to request the symbols on the screen. In reality, a multi-step process is usually needed (Agius and Vance, 2016). The report that children were not able to access the iPads correctly, but were excited about their use, limits the generalizations that can be made about the effectiveness of iPads as SGD.

### **Future Research and Conclusion**

More research is needed on how AAC affects certain groups and how to use AAC most effectively, both individually, and as a wider system. Studies are needed that expand beyond studying people with autism spectrum disorder to people who have CCN and who use alternative access. It is also important to study older individuals including adults who have used AAC throughout their life, adults who do not have a history of AAC use throughout their life, and adults who developed disabilities later in life. This research would help answer questions about AAC modeling as an effective intervention across the lifespan and whether there is an optimal

match between one's skills and the type of AAC used (Sennott et al., 2016). A focus on disability severity to decide an intervention plan needs more support in the research literature, too (Kuhn and Marvin, 2016).

More research is also needed on access to AAC methods. Agius and Vance (2016) found a lack of pattern and preference for different types of AAC. Introducing and using a variety of methods prior to choosing an AAC modality for a child with autism spectrum disorder could be useful. Navigation, and how to do so, is an area that is lacking research. As children learn the iPad condition or how to use any other SGD, navigation should be part of protocol development (Agius and Vance, 2016). However, what is most needed are "studies that show how schools, districts, and whole states can take these strategies to scale" (Kleinert et al., 2015, p. 325).

Overall, there is a positive trend to AAC use both inside and outside of the classroom, given beneficial partner instruction, spacious interactional patterns, and adequate modeling of the child's preferred communication system. Oral language development begins in every child at a very young age. Language modeling should begin early in life, too, long before the child is expected to be a fluent verbal speaker. This early and frequent instruction could close the gap between the language that verbal children and AAC users are able to access. With intensive instruction through intervention, children can become more fluent and comfortable communicating in a variety of settings, with a variety of partners. In order to confirm to a child that they have a right to a full communicative experience on their own terms, language partners must be able to speak the child's language.

## Annotated Bibliography

Agius, M. M. and Vance, M. (2016). A comparison of PECS and iPad to teach requesting to pre-schoolers with Autistic Spectrum Disorders. *AAC: Augmentative and Alternative Communication*, 32(1).

This article compares the effectiveness of Picture Exchange Communication System (PECS) with iPads used as a speech generating devices for preschoolers with limited functional speech. The authors found that both methods are productive and appropriate in teaching requesting as communication at a young age, although more teaching and prompting was required for the iPad condition. This article discusses how preschool children, who are beginning communicators, responded to different communication techniques. It also addresses various methods of communication that are available to children who are non-verbal or who have a significant speech delay.

Bae, B. (2012). Children and teachers as partners in communication: Focus on spacious and narrow interactional patterns. *International Journal of Early Childhood*, 44(1).

This article portrays how a teacher's relationship with his or her students can affect how both parties interact in the classroom. When both teachers and students are more empathetic in trying to understand one another, partnerships of mutual respect are built and participation grows. Interactions between teachers and students can be described as spacious or narrow based upon a teacher's mindset about, and interactions with, his or her students. Neither the role of the teacher or student should be fixed, but rather fluid to allow for more learning to take place. This article affirms that participation is heavily influenced by relationships. Participation with, engagement with and trust in one's

communication partner positively affect one's ability to communicate.

Baxter, S., Enderby, P., Evans, P., and Judge, S. (2011). Barriers and facilitators to the use of high-technology augmentative and alternative communication devices: A systematic review and qualitative synthesis. *International Journal of Language and Communication Disorders*, 47(2), 115-129. doi:10.1111/j.1460-6984.2011.00090.x

This piece is a literature review of the usefulness and practicality of high-technology systems, such as voice output communication aids and speech-generating devices. High-technology systems are one of two systems that fall within the category of aided AAC. The authors review the sensibility of high-technology devices in the categories of: reliability, availability of technological support, voice/language of the device, making decisions, time generating a message, family perceptions and support, the role of the communication partner, service provision, and staff training. Since high-technology devices are one form of assisted AAC, it is helpful to know of other prior research on this subject. All of these aspects are important to consider when planning an intervention for a child with a high-technology speech-generating device.

Center for Technology and Disability. (n.d.). Get them talking: Communication boards for toddlers and preschoolers. Retrieved from <http://www.1donline.org/article/65303/>

This website provides two activities to complete with a partner on two communication boards. One communication board consists primarily of nouns, or fringe words, and the other consists of core words primarily used by toddlers. Users will discover that it is easier to communicate on the core word board. Children must have access to a variety of vocabulary words that offer flexibility in developing language. They also must have modeling of AAC very frequently, and from a very young age.

Chung, Y., and Douglas, K. H. (2014). Communicative competence inventory for students who use augmentative and alternative communication: A team approach. *Teaching Exceptional Children, 47*(1), 56-68. doi:10.1177/0040059914534620

These authors describe a method of increasing peer interactions between students who use AAC and their peers. AAC is essential to those communicators who have Complex Communication Needs (CCN). It is important that these students are also able to communicate with teachers and peers using the language that they are most familiar with, with various partners in numerous settings. Communicative Competence Inventories are included and described as a way of collecting data on AAC use and the student as an active communicator. This article provides the interesting perspective of students participating with their peers through the use of AAC. The inventories provide practical ways to gather data during those interactions. This team approach helps alleviate barriers in conversations and instead promotes a shared responsibility.

Dodd, J. L., and Gorey, M. (2013). AAC intervention as an immersion model.

*Communication Disorders Quarterly, 35*(2), 103-107. doi:10.1177/1525740113504242

This article defines several terms related to AAC, particularly phases of the intervention process, core vocabulary, and fringe vocabulary. Language stimulation techniques translated to AAC intervention are also included. The authors describe one type of intervention but they do not implement it with a child or children with complex communication needs (CCN). The authors do list concerns to consider if it is decided that this immersive intervention model will be used with a student, including a high adult-to-student ratio and training by the communication team in strategies outlined in the article. This article gives some beneficial definitions of useful terms to know. The intervention

described could easily be implemented into action research in the classroom.

Halloran, J., and Halloran, C. (2006). *LAMP: Language acquisition through motor planning*. Wooster, OH: The Center for AAC and Autism.

This is a resource booklet about a program called “Language Acquisition Through Motor Planning” (LAMP). This program is composed of five components: readiness to learn, joint engagement, unique and consistent motor plans, auditory signals, and natural consequences. Although this resource was written in 2006, it is valuable because some of the practices it details are just now starting to be implemented in work with children who are nonverbal or who have limited verbal ability. This is landmark research and work in the field of alternative and augmentative communication strategies because it introduced the idea of a motor plan and the importance of predictability in speech.

Kent-Walsh, J., Murza, K. A., Malani, M. D., and Binger, C. (2015). Effects of communication partner instruction on the communication of individuals using AAC: A meta-analysis. *Augmentative and Alternative Communication*, 31(4), 271-284.  
doi:10.3109/07434618.2015.1052153

This article is a review of many other bodies of research about the effects of partner intervention and instruction on AAC use by individuals with complex communication needs. The research is overwhelmingly positive in favor for having well educated communication partners. However, some limitations are included that could be barriers to instruction, such as lack of time or resources for clinicians working with these partners. This review is helpful because it encompasses many relevant, landmark studies in the field and greatly supports the research question in this paper.

Kleinert, H., Towles-Reeves, E., Quenemoen, R., Thurlow, M., Fluegge, L., Weseman,

L., and Kerbel, A. (2015). Where students with the most significant cognitive disabilities are taught. *Exceptional Children*, 81(3), 312-328. doi:10.1177/0014402914563697

This article urges the reader to consider the environment in which students with significant disabilities are taught and to find the “Least Restrictive Environment” (LRE). Teachers should consider the appropriateness of requiring time in the general education classroom and the benefits that that setting may provide. Many statistics are provided about where and how students with the most significant cognitive disabilities across fifteen states are taught. Positive trends are reported between: inclusive classrooms and expressive communication and inclusive classrooms and math skills. Negative correlations were drawn between self-contained settings and the use of AAC. This article, more than the others, considers the setting for students with complex communication needs and significant cognitive delays. It is interesting to note how the setting impacts learning and communication across a broad range of subjects.

Kuhn, M. and Marvin, C. A. (2016). “Dosage” decisions for early intervention services.

*Young Exceptional Children*, 19(4); 20-33.

This article details factors to consider when making in-home programming recommendations for a child with special needs. The authors defend that “dosages” refer less to the amount of hours and days a child spends in programming, and more about what practitioners do with those hours and days. Keeping parent and family goals in mind is key as the team aims to support and enhance family-child relationships. This article gives the perspective of families, which is welcome and needed in conversations regarding a child’s alternative and augmentative communication (AAC) needs. Parents are a valuable part of the IEP team; therefore, literature pertaining to parent-child and

parent-teacher interactions must be included.

Sennott, S. C., Light, J. C., and Mcnaughton, D. (2016). AAC modeling intervention research review. *Research and Practice for Persons with Severe Disabilities*, 41(2), 101-115. doi:10.1177/1540796916638822

This literature review advocates for greater “symmetry” between language input and output for a child with significant communication needs resulting from a disability such as autism, or other developmental disabilities. The author advocates for naturalistic communication interactions that occur during regular and routines parts of a child’s day. The child should be immersed in the language that she or he is expected to one day speak. Results of analyzing data for the review indicated that children’s changes in communicative skills were altogether large and positive in the areas of pragmatics, semantics, syntax, and morphology.

Steen, B. (Dec 2016/ Jan 2017). Encouraging oral language development in children with speech delays. *Teaching Young Children*, 10(2), 28-30.

This article outlines four myths and how to overcome their stereotypes in the classroom setting with the child with speech delays. The authors call for inclusion, positive peer interactions, numerous opportunities for communication, and modeling. This author also advocates for the child to receive grammatically accurate communication in a variety of ways, including verbal speech even if they do not speak verbally themselves. Exposure to language, in a variety of ways is emphasized throughout as an appropriate and valuable teaching tool. This article is about the specific demographic studied here. It also expels myths that are very prevalent in the world of early childhood special education. It is important to use these truths as evidence to support children’s oral language

development.

VanTatenhove, G. (n.d.). Communication Prompt Hierarchy. Retrieved from

[http://www.minspeak.com/teachers/documents/Module\\_1\\_Script\\_Cards\\_4\\_6.pdf](http://www.minspeak.com/teachers/documents/Module_1_Script_Cards_4_6.pdf)

This resource is a one-page PDF file depicting four steps for prompting communication.

This resource breaks down how a practitioner should begin and progress as a communication partner to someone who has communication delays. Partners are instructed to: state, suggest, say, and assist. This resource emphasizes modeling as the first step and assistance as a last resort. Due to its simplicity, the knowledge from this resource could very easily be applied in a variety of settings.

## Appendix A

## Key Terms and Concepts of AAC

The following terms are associated with understanding augmentative and alternative communication and its use by children who do not communicate verbally. These terms define the major ways in which AAC can be accessed. Terms are identified and defined. An example or application of that term or concept is also included, as well as the reference to the source where more information can be found.

**Table A1: Key Terms and Concepts of AAC**

<b>Key terms/ concepts</b>	<b>Definition</b>	<b>Example(s)/ application(s)</b>	<b>Citation(s)</b>
Complex Communication Needs (CCN)	Requiring alternative methods for language acquisition and communication.	Often as a result of having autism spectrum disorder, cerebral palsy and other developmental disabilities.	Sennott, et al., 2016.
Augmentative and Alternative Communication (AAC)	Methods of communicating that can be added to natural speech or writing, or are used in place of spoken communication or writing.	Aided systems: pictures, speech-generating devices (SGD), writings, etc.  Unaided systems: signs, gestures, speech, vocalizations, etc.	Sennott, et al., 2016; Chung and Douglas, 2014; Baxter et al., 2011.

Aided Language Stimulation (ALgS)	Oral speech and language represented on a communication aid.	High- or low-technology systems including electronic speech-generating devices and the Picture Exchange Communication System (PECs).	Dodd and Gorey, 2013.
Unaided-technology systems	Ways of communicating that do not require any external equipment to communicate.	Gestures, manual sign.	Agius and Vance, 2016.
High-technology systems	Method of ALgS that provides a synthesized voice or written output to communicate.	Voice output communication aids (VOCA), Speech-generating devices (SGD), and software on a personal computer.	Baxter et al., 2011.
Low-technology systems	Method of ALgS that is non-powered and often handmade.	Communication books or boards, written words on paper, photos, line drawings, and pictograms.	Baxter et al., 2011.

Core vocabulary	Words that can be used in many settings and throughout many activities. These words can convey a range of communicative functions.	Examples of core words: come, drink, eat, get, go, more, on, turn, work, you.	Dodd and Gorey, 2013, Halloran and Halloran, 2006.
Fringe vocabulary	Context specific words, which are unique to an individual's environment and interests.	Examples of fringe words: cow, pumpkin, scooter, lemonade.	Dodd and Gorey, 2013; Halloran and Halloran, 2006.
Picture Exchange Communication System	A system wherein the user communicates by exchanging a symbol with a communication partner. This can be a physical picture from a book of pictures (low-technology) or a speech-generating device (SGD) that provides voice output (high-technology).	PECS is composed of six stages: 1.) Requesting a preferred item, 2.) Communicating with different partners, 3.) Finding the correct symbol upon request, 4.) Responding to sentence starters, 5.) Responding to questions, 6.) Responding to more complex sentence starters.	Agius and Vance, 2016.
Speech-Generating Devices (SGD)	An electronic device that provides voice output when utilized.	Tablets equipped with voice output software	Baxter et al., 2011.

Appendix B

Key Terms and Concepts of AAC Map

This map is composed of the key terms and concepts associated with using augmentative and alternative communication. It depicts how these terms and concepts are related and how they can be broken down into smaller categories. This map defines the major ways in which AAC can be accessed. Terms within the paper are identified here and their relationship is shown.

**Map B1: Key Terms and Concepts of AAC Map**

