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Autism and AAC: A Case Study

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Autism and AAC: A Case Study

Introduction

Past studies have shown that the use of Augmentative and Alternative Communication (AAC) has been successful in facilitating the communication needs for individuals with autism (Cafiero, 2005; Miranda, 2013; Wegner, 2012). AAC, as defined by the American Speech Language and Hearing Association (2002), is "... a set of procedures and processes by which an individual's communication skills (i.e., production as well as comprehension) can be maximized for functional and effective communication. It involves supplementing or replacing natural speech and/or writing with aided (e.g., picture communication symbols, line drawings, Blissymbols, and tangible objects) and/or unaided symbols (e.g., manual signs, gestures, and finger spelling)" (American-Speech Language-Hearing Association, 2002). The many types of AAC systems can be beneficial for multiple communication needs. Although there is a separation of systems, many say that the best use of AAC is multimodal, using more than just one system, to ensure that all communication needs are met (Wegner, 2012).

Autism is defined as a disorder that causes deficits in a variety of areas including: social interaction, communication, and restrictive and repetitive behaviors (American Psychiatric Association, 2013). For diagnosis, symptoms must be observed early in development and must not be due to some other disorder, such as intellectual disability (American Psychiatric Association, 2013). Communication can be impaired in a variety of ways for individuals with autism (American Psychiatric Association, 2013; Gerber, 2003). When the ability to communicate is severely impaired, the use of an AAC is a viable way for a person to communicate (Light, 1989; Light & McNaughton 2014). There are many different challenges

that accompany the use of an AAC for an individual with autism, but the research has shown positive outcomes (Beukelman, D., & Mirenda, P., 2005; Cafiero, J.M., 2005; Drager, K.D., 2009; Drager, K. D., et al., 2006; Mirenda, P., & Brown, K., 2009; Mirenda, P., 2013; Porter, G., & Cafiero, J. M., 2009; Schlosser, R. W., & Wendt, O., 2008; Wegner, J. R., 2012). Through different types of intervention, a person with autism may learn how to use an AAC to communicate (Jansen, B., 2013; Nunes, D., & Hanline, M. F., 2007; Trembath, D., Balandin, S., Togher, L., & Stancliffe, R. J., 2009).

Autism and Language

There is a multitude of different speech and language problems that can occur for an individual with autism (American Psychiatric Association, 2013; Gerber, 2003). Background issues can affect the initial language development, which will delay the child's ability to communicate (Gerber, 2003). The challenges with autism may also arise during therapy, making the therapy more challenging. From a developmental perspective, the three parameters of language are form, use, and content, but these are affected by engagement and effort (Gerber, 2003). A deficit in any of these domains would ultimately lead to problems with language and communication. Effort involves the cognitive abilities of an individual to learn language and is mainly associated with form and content (Gerber, 2003). Engagement is defined as "the social and emotional motivation for learning a language in the first place" and often has an effect on use and content (Gerber, 2003). Engagement is made up of three very important aspects: shared attention, reciprocity and shared intentions (Gerber, 2007). Shared attention is when a child looks to have a connection with a communication partner and also wants to also keep the partner's attention (Gerber, 2007). Reciprocity is the flow and rhythm of the communication between the child and partner (Gerber, 2007). Even if there are no words, there is a back and forth between

the two, that would sound like conversation (Gerber, 2007). Shared intention is when the child initiates and responds to different communication gestures, which could be a question or a physical gesture (Gerber, 2007). Engagement plays a very important role in development when an infant is first starting to communicate, even non-verbally, with a caregiver (Gerber, 2003). When applying how engagement plays a role in language development to an individual with autism, it is important to understand the developmental level of the child (Gerber, 2003). A clinician must first help the child with engagement, and then they will be able to assist the child with learning communication (Gerber, 2003). If a child does not have the necessary motivation to communicate or the intellectual capacity to do so, it would be very difficult for a speech-language pathologist (SLP) to assist in developing language and communication for this child.

One obstacle to learning communication and using language for an individual with autism is emotional regulation (Prizant, Wetherby, Rubin, Laurent, & Rydell, 2006). Emotional regulation does not have a standard definition, however, it is the idea that an individual is capable of expressing their emotions in socially acceptable ways (Southam-Gerow & Kendall, 2002). When emotions are not regulated, they could cause an inability to pay attention, communicate, and solve problems (Prizant et al., 2006). Problems with emotional regulation could hinder the motivation for communication and impede language development (Prizant et al., 2006). It would be beneficial for the child to first learn how to communicate their emotions to their parents or caregivers in order to learn how to control them (Prizant et al., 2006). Giving individuals an AAC system as a way to communicate their emotions can mitigate unwanted behaviors due to emotional dysregulation (Prizant et al., 2006). Children with autism often have a difficult time with emotional regulation and do not express their emotions appropriately (Prizant et al., 2006; Southam-Gerow & Kendall, 2002). By expressing what they are feeling,

they are able to show the communication partner their emotions, creating less frustration for both parties. If this is accomplished, an individual with autism could engage with a communication partner, and have more potential to develop a way to communicate.

AAC

Light (1989) created a definition for communicative competence and this idea is integral to determining what individuals are good candidates for the use of an AAC for functional communication. This definition included “(a) functionality of communication; (b) adequacy of communication; and (c) sufficiency of knowledge, judgment, and skill.” The “sufficiency of knowledge, judgment, and skill” are related to four sub-aspects of communication competence: linguistic, operational, social, and strategic (Light, 1989). Light and McNaughton (2014) recently updated this definition to compensate for new populations that use AAC, what communication can be facilitated by AAC, updated technologies that are utilized as AAC, and the use of AAC in normal social settings. Light and McNaughton (2014) also expanded upon the previous definition to include the importance of the psychological factors that play a role in the four sub-categories. Specifically, they found that one major psychological factor that could impact the use of an AAC was the motivation to communicate (Light & McNaughton, 2014). Individuals with autism may have deficits in this area that could present as a challenge when teaching them to use an AAC system to communicate (Light & McNaughton, 2014; Gerber, 2003; Prizant et al., 2006). However, these changes that have taken place have not altered the underlying objective, which is to provide individuals with functional communication (Light & McNaughton, 2014).

Types of AAC Systems

The lowest level of AAC system is unaided, meaning they require no outside materials (Wegner, 2012). The biggest draw back with this unaided option is the requirement of complex motor movement. Although the motor movement is not as complex as speaking, some individuals with autism who have communicative motor difficulties may also have trouble forming the hand shapes (Wegner, 2012). It has been suggested that these signs may be used alongside another AAC system to ensure full communication (Wegner, 2012). The next level of AAC would be an aided, low-tech option. There are two widely used low-tech options for autism, the graphic communication system and the picture exchange communication system (Wegner, 2012). The graphic system is based on graphic symbols and a static display (Wegner, 2012). The child would be able to communicate by pointing to a graphic to communicate a message. This system can be helpful in requesting, choice making, and can also be used by the therapist as language comprehension. For example, a visual schedule could be used to allow the child to understand the order of events during a therapy session (Wegner, 2012). A graphic system allows for better understanding between the individual with autism and their possible communication partner (Wegner, 2012). On the other hand, this aided AAC is something that needs to be carried around which is less convenient than an unaided option (Wegner, 2012). The second low-tech system is the Picture Exchange Communication System (PECS). This system is similar to the graphic system, in that it uses pictures or symbols as the main communication mode. However, Bondy and Frost (1994) designed their program to be used specifically with young children who have autism to work on their requesting while also interjecting some behavioral methods (Wegner, 2012). This system is made up of four training phases that incorporate behavior regulation into the language learning process (Wegner, 2012). When moving on to a high tech option for AAC, the main tool is a speech-generated device (SGD). A SGD is, in general, a

portable piece of technology with voice output when activated by the user (Wegner, 2012). There are many different ways in which a SGD may work, ranging in options for symbol style, types of display and vocabulary types (Wegner, 2012). There are three main graphics used on SGDs: photos, line drawings, and written words (Wegner, 2012). The symbols can then be set up in a display that is static, dynamic, or in a visual scene display (Wegner, 2012). A static display is one that does not move and the vocabulary is unchanging (Wegner, 2012). A dynamic display is one that will bring up new vocabulary when activated; usually the vocabulary is separated into different categories (Wegner, 2012). The final display is the visual scene display (Wegner, 2012). This display is a picture that is representative of an environment or event (Wegner, 2012). The vocabulary is then integrated into the objects of the scene, so that when the object is activated, a message related to that object will appear (Wegner, 2012). The static and dynamic displays are on a grid format, while the visual scene display uses a picture that contains the vocabulary (Wegner, 2012). These AAC systems can be used alone, or in a multimodal context, with a child having multiple options of communicating.

Using An AAC

When working with any type of AAC, the words that are being picked for the vocabulary need to be useful in the child's day-to-day life, in multiple contexts. Therefore, a core vocabulary should be developed which includes all the essential words that are used by the person (Beukelman & Mirenda, 2005). From there, a fringe vocabulary could be added on, either because of some activity done in class or at home needs words that are specific to the activity (Beukelman & Mirenda, 2005). This organization allows a child to learn their core vocabulary and not be overwhelmed by a large number of words, some of which are not important for

everyday life. However, it is important that the vocabulary is expanded as time goes on, as the child may be learning new words to use (Beukelman & Mirenda, 2005).

As many individuals have unique needs, the most effective AAC system must be designed to ensure their best communication. If there is a problem with the use of an AAC, the device may be abandoned (Johnson, Inglebret, Jones, & Ray, 2006). Johnson and colleagues (2006) conducted a survey in an effort to understand in what situations AAC was successful and when it was not. In the study, 11 SLPs were asked two open-ended questions about the different variables they observed when AAC was successful or when it was not (Johnson et al., 2006). A list from the answers given by the SLPs was compiled and then used as a survey (Johnson et al., 2006). This survey was given to 17 SLPs at the American Speech Language and Hearing Association (ASHA) convention (Johnson et al., 2006). The third part of the study was a survey sent out to over 1000 people chosen from the ASHA special interest group for AAC who were to report on the success or abandonment of an AAC (Johnson et al., 2006). The results showed that there was often not just one factor that could determine success or abandonment for AAC use (Johnson et al., 2006). However, success was often associated with the theme of support in multiple contexts, including with clinicians, family, educators, and other communication partners (Johnson et al., 2006). The factors of unsuccessful use of an AAC reported by the SLPs were found to be fear of technology, the social stigma of a device, and lack of motivation (Johnson et al., 2006). This lack of motivation can be tied back in with the emotional regulation problems associated with autism (Prizants et al., 2006). This study was designed to gain insight into what SLPs perceived as the situations in which an AAC was used successfully. When these themes are understood, an environment that would promote success can be enacted.

Autism and AAC

When evaluating whether a child is a good candidate for AAC, it is important to refer back to the effort and engagement aspects of language learning. The definition given by Light (1989), states that social use of language is an important factor when looking at who should use an AAC. If a child does not have the motivation to communicate, they lack an aspect of communicative competence put forth by Light, and therefore, may be unsuccessful in learning to use the AAC effectively (Light, 1989; Light & McNaughton, 2014; Gerber, 2003) Engagement is needed to develop any type of language, including the use of an alternative method (Gerber, 2003). Once the child has met the criteria, they can continue on to use an AAC.

It has become more common for an individual with autism who presents with communication deficits to use an AAC, whether it is to enhance their current language or to become a language replacement (Mirenda 2013). Schuler and Baldwin (1981) suggested that individuals with autism can have better language comprehension when the visual system is used, making them the ideal population for the visual-spatial system of aided AAC. Later, Cafiero (2005) pointed out the parallels between autism and AAC in his paper with the learning styles of individuals with autism matching the learning requirements for use of an AAC (e.g., visual learning to use of visual cues). Not only are individuals with autism an ideal match for AAC due to their visual learning strengths, but the use of an AAC could also prevent behavior problems, due to the ability to communicate emotions effectively (Cafiero, 2005). Both of these pieces of evidence create a strong argument for the use of an AAC with children who have autism.

Autism and Input through AAC

Recently, clinicians have been using AAC systems as a means to provide language input for individuals with autism. This allows the individual to receive input in the same manner that they are communicating with expressively. This not only provides better comprehension but

allows for the communication to be modeled for the child. Porter and Cafiero (2000) suggest that to have successful input, the clinician must provide a variety of vocabulary as well as many models of the use of this vocabulary. A typical developing child will hear and observe over a thousand words every hour, so clinicians and parents should strive to give a child who uses AAC the same amount of exposure to language (Porter & Cafiero, 2000). Sussman (1999) explains that visual helpers can be used in a variety of input, including future events and the feelings of others. By showing a child the events of a day through their AAC system, possibly a daily schedule, they will be provided with a constant visual remind of the order of events. Spoken language is often temporary and even if the child understands the meaning of the words at the time, the message could be lost later on and cause difficulties. The visual helper will create less frustration for the child, allowing them to refer back to the visual, either on their own or through prompting (Sussman, 1999). AAC is not only an expressive tool for individuals with autism, but can be used receptively to communicate messages (Porter & Cafiero, 2000; Sussman, 1999).

“Cookie cutter” intervention programs are not effective when treating the wide variety of abilities in individuals who have autism. The language deficits could also be drastically different. When studies have been conducted with autism and the use of an AAC, the studies are usually single subject or small subject number studies (Drager et al., 2006; Jansen, 2013; Nunes & Hanline, 2007; Trembath, Balandin, Togher, & Stancliffe, 2009). Although it is hard to generalize these smaller sample studies, the studies can be used as a starting point for other cases that present with similarities. Overall, an individual with autism has the capacity to use an AAC with positive results when they have both the effort and engagement required for learning language (Beukelman & Mirenda, 2005; Cafiero, 2005; Gerber, 2003; Mirenda, 2013; Wergner, 2012).

Intervention: Aided Language Modeling

Given that individuals with autism have the skills required to use an AAC, intervention could work to cultivate these skills and make the use of an AAC effortless. Just as a typical child will gain expressive and receptive language through modeling, an individual using an AAC as a language replacement would also need to observe a model to help learn language expressively and receptively (Drager, 2009). Therefore, modeling can also be an effective intervention strategy for teaching an individual with autism how to communicate as well as comprehend using an AAC. Drager et al. (2006) investigated the Aided Language Modeling (ALM) intervention during a multiple baseline study with two preschool children. The study tested the symbol comprehension of the children after participating in the ALM intervention (Drager et al., 2006). The end result was that both children made improvements in the comprehension and production of a symbol and were able to maintain that knowledge after therapy had ended (Drager et al., 2006). Although this study is very limited due to the small number, it provided evidence that modeling intervention could be a suitable way for individuals with autism to learn to use an AAC. More studies with a larger sample are needed in order to generalize the studies to the population. Clinicians have traditionally been the model for AAC use to individuals with autism, but parents and other persons in the individual's life can also facilitate language learning for the child by using modeling in multiple contexts.

To date, there are a limited number of studies conducted on how parents, or other populations, can model AAC use to an individual with autism. Clinicians are the main population for this intervention strategy, but other studies have looked at peers, parents, and siblings. A peer modeling study conducted by Trembath et al. (2009) investigated how three individuals with autism responded to two typically developing classmates implementing the model with and

without a speech generated device (SGD) during play sessions. The study does not specify what level of severity of autism that the children have (Trembath et al., 2009). The results were positive during the therapy, with all three children making improvements in interactions with peers (Trembath et al., 2009). However, there was only one child who was able to maintain this interaction level once the therapy had ended (Trembath et al., 2009). If the individual with autism responded well to the peer model, the peer was more likely to model again, due to the positive response (Trembath et al., 2009). Peers who model AAC use for individuals with autism may be successful, however, they are usually less reliable than a clinician who may be better equipped to provide language input using an AAC for a child. One study conducted with a parent as a model was successful in increasing some communication between caregiver and child (Nunes & Hanline, 2006). The mother of a child with autism was trained in naturalistic modeling techniques to use during household activities (Nunes & Hanline, 2006). During four scenarios that happen within the household, the mother was trained to use communication cards to model during the activity (Nunes & Hanline, 2006). The results showed improvements in communication for two of the scenarios, but not all (Nunes & Hanline, 2006). However, it was observed that the participant did increase his use of AAC, as well as his communicative gestures (Nunes & Hanline, 2006). The reliability of the study is questionable as the parent could have performed the intervention incorrectly and since this was a study about one specific case, it is difficult to know if the intervention will be beneficial for the entire population of individuals who have moderate autism and use an AAC (Nunes & Hanline, 2006). Finally, there was recently a master's thesis written about sibling modeling with an individual with autism who used an AAC (Jansen, 2013). The study examined two sibling pairs, only one of whom was diagnosed with autism, and found that there were increases in both pairs for communication

through the AAC during play (Jansen, 2013). This is the first study done on sibling modeling, even though a sibling can be a consistent communication partner for individuals who use an AAC system (Jansen, 2013). This study does suggest that sibling modeling would be a viable intervention strategy, but more research is needed. From all the research done on the subject of a non-clinician doing the modeling, the studies have relied heavily on a single-subject design. This is mostly due to autism being a spectrum diagnosis, with each individual having unique challenges in language and speech. These studies can be used as an example for therapy options when children who have autism share the same deficits.

The studies related to ALM for individuals with autism who require an AAC to communicate do not specify what the severity level of autism, or if they do, but it is not as important as the level of language development. The individuals with autism who are more likely to have greater communication and language deficits are those who are diagnosed with moderate or severe autism. However, a therapy intervention cannot be based solely on the severity of the individual's autism, but must take into account the communication deficits that present in each individual.

Hanen Program

Parents are a huge part of their child's language development, which can be difficult when the child is having some problems learning language naturally. Parents may not understand what their child may need when the child is having some difficulties learning language. The Hanen program teaches parents how to be an active participant in the language learning of their child (*More Than Words – The Hanen Program for parents of children with autism spectrum disorder*, 2011).

“More Than Words” (MTW) is a program that was developed by Hanen to help parents of children with autism to improve the child’s communication (*More Than Words – The Hanen Program for parents of children with autism spectrum disorder*, 2011). The program focuses on engaging the child in a fun, interactive way to teach language (*More Than Words – The Hanen Program for parents of children with autism spectrum disorder*, 2011). The program is taught by a certified SLP and allows for the parents to gain knowledge of useful strategies to improve the communication of a child in their day-to-day lives (*More Than Words – The Hanen Program for parents of children with autism spectrum disorder*, 2011). In regards to AAC, the program has a training session about the use of visual aids and how a parent may use them to promote a child’s communication (Sussman, 1999). These visual helpers are based on the child’s specific level, according to the Hanen program. The hierarchy of the visual helpers is as follows: real objects, colored photographs, line drawings, printed words (Sussman, 1999). Visual helpers that are most representative of the actual object will be better understood by a child in the earlier stages of their language development (Sussman, 1999). The first stage of communication, according to the program, is the “own agenda” stage (Sussman, 1999). When a child is at this stage, they would most likely benefit from visual helpers that are real objects, photos, or food labels that have been cut directly from the packaging (Sussman, 1999). This type of visual will provide direct meaning for the child and be more easily understood (Sussman, 1999). The next stage would be the “requester” stage. At this stage, a child may use the physical objects and photos as well, but can also understand colored photos and drawings, adding on from the last stage (Sussman, 1999). Then, a child at the “partner” stage would be able to use all kinds of pictures as well as printed words (Sussman, 1999). The visual helpers can help with communicating to the child as well as the child communicating with others (Sussman, 1999). Some situations in which these visual

aids can be used are in choices, feelings, daily activities, or a reminder of how to do something independently (Sussman, 1999). All of these things will help a parent with communicating to their child in a way that the child will better understand and it will model to the child how to communicate back, using the same visual aids.

“More Than Words” (MTW) is an evidence-based program that has been tested by independent researchers to test the effectiveness of its techniques. A study conducted by Carter and associates (2011) found that the MTW program did improve communication for individuals with a low baseline. They suggest that the MTW program is successful, but does have a cut off where the program becomes less effective (Carter et al., 2011). Carter states that although the test does not show significant differences, the effect size was more important to detail the success of the program (2011). Some children made advances in their communication and were able to maintain these results during a follow-up (Carter et al., 2011).

Purpose

The purpose of this paper was to take an in-depth, qualitative look at two children with autism. It will examine the communication skills, the use of an aided AAC device, and the positive and negative outcomes of an AAC. Each participant will be observed during the course of a semester. The study will hope to build upon the literature that has already been published about the use of an AAC for an individual with autism. It will provide observations about two different cases that can be used as a backbone to future research or therapy. The overall goal of this case study to help clinicians make clinical decisions about therapy about the use of AAC when working with individuals who have autism.

Method

For this project, two children were chosen from the Truesdail clinic. Both children were not using an AAC system to communicate. Observations were made on the use of the AAC systems as well as how the specific deficits experienced by individuals with autism plays a role in the learning of an AAC and communication.

The first child is T. T had been at the Truesdail clinic for a number of years. T had been using his AAC system while at the clinic, which is the iPad application Proloquo2go. Observations were recorded and examined, focusing on T's use of the AAC system. The clinicians implemented new strategies to promote the use the AAC system that was in place, as well as adjusting the system on a need basis. This took place from September 2015 until December 2015 biweekly for 50-minute sessions. After each session, observations were recorded in a narrative style. Post-clinic, the video database, Vbrick, was used to revisit these session times to make observations more thorough.

Z is the second child. He was new to the Truesdail clinic and had no AAC system in place. Similar to T, observations were made after each therapy session. The clinicians attempted to determine what combination of AAC systems would work best. Z was enrolled in sessions from November 2015 to April 2016, biweekly for 50-minute sessions. Post-clinic, the Vbrick video database would be used to make observations more thorough.

This study is based on qualitative information that is gathered through observations and conclusions are based off the observations and current literature on the subject.

T Case Study: Best Laid Plans

T is a young boy of 9 years old. He started at the Truesdail center in 2010. He was diagnosed with autism at an early age with a comorbid diagnosis of childhood apraxia of speech. At the time of the initial evaluation in 2010, T was evaluated for his level of communication,

auditory comprehension, expressive communication, and childhood apraxia of speech. T was 4 years of age at the time. He demonstrated emerging levels of communication and delayed auditory compensation and expressive communication. His language production was evaluated to be at a 12-18 month level. T was assessed for his levels of communicative intent, which included emotions, eye gaze, and gestures. The clinician was unable to preform the Kaufman test for childhood apraxia, so the results relied on the previous evaluation. In the spring semester of 2014 at the age of 8, T worked with a graduate clinician and seemed to be making great progress with his SGD. From video reviewed from the 2014 sessions, T seemed engaged with the clinician and would consistently use the device to communicate during activities. T was able to participate in the activities as well as use the device to communicate messages to the clinician, such as “rub my head.” T’s behavior in 2014 seemed more relaxed and attentive compared to the observations made in 2015. T’s AAC use had declined since his sessions in 2014, and a goal for the 2015 semester would be to work on his AAC use. During the Fall 2015 semester, T’s goals included: text related activities, attend to modeling of high/low tech AAC use by the clinician, and request to the clinician when he was feeling sensory seeking. This last goal was changed mid-treatment to having T use joint attention with the clinician.

T’s Weaknesses

Lack of Motivation. T’s biggest challenge seemed to be his motivation to communicate with another person during therapy. The motivation to communicate is described by Gerber (2003) as the *engagement* a person possesses, and is a key factor for learning language and effective communication. The clinician understood some of the issues that T had presented with in the past. The therapist made many plans to alleviate these challenges. One solution to these challenges was to adapt the environment to ensure fewer distractions in the therapy room. The

light switch and cabinets were locked and games and toys would be ready to play for easy transitions to reduce distractions in therapy. Once the distractions were decreased, the clinician hoped T would be able to focus on the therapy. Yet, T was still experiencing emotional and sensory regulation problems, which resulted in off task behaviors.

Escape Behavior. Another obstacle to T's progress was T trying to escape the room. During session, when T wanted to leave the room, he would use his proloquo2go to ask for the restroom. The clinician knew that escape was his real intention and not the need to use the restroom. T would also decide to run out of the room. When he seemed agitated, the clinicians would stay close to the door in order to prevent him from running out. During one particular session, T was engaging in a seemingly enjoyable activity for him. He suddenly ran from the room and was out the door before we could react. Even during engagement in an activity, he still felt the need to run from the room. This could have been more of a game to him to get the clinician to chase him since he had her attention. After the instance, he was not upset, but laughing and having fun.

Frustration. During therapy, T had a hard time communicating his emotions to us, causing some frustration and often more problems. He would either be frustrated about having to do the activity and not attempt it, or he would be too giggly and would do things that were not appropriate for the activity. This emotional dysregulation is common in individuals with autism, and an effective way to alleviate their frustrations is to allow them to communicate their feelings (Prizant et al., 2006). One instance of dysregulation was when T allowed his giggles to interrupt therapy during a cooking activity. The clinician planned to make a cake and T was supposed to pick the order the ingredients were mixed into the bowl. He was more interested in throwing the

instructions on the ground rather than putting them in order. T did eventually become regulated and calm and was able to complete the activity.

One other major problem that was associated with T's autism was his seeking of sensory input. At the time of therapy, he was not currently enrolled in Occupational Therapy (OT). His mother had informed us that he had begun to sensory seek using his mouth, either for chewing or spitting. This was a distraction when he did not have some item to chew on freely and was constantly seeking something to use. His mother tried to bring these "chewies", but would sometimes forget, creating a bit of a distraction for T. He also enjoyed the sensation of spitting. He would do this on the floor, on his clothes, on an inflatable purple canoe, and a sensory snake. This was less of a problem, but T understood that this was inappropriate behavior for him, and so the clinicians attempted to encourage his use of AAC to communicate whenever he felt the desire to seek oral stimulation. These sensory seeking behaviors were a problem in therapy, as the clinician was focusing on these behaviors rather than his communication needs. Therapy may have been different if T was also receiving OT and was working on his sensory seeking. This may have alleviated some of the problems we experienced during speech therapy.

T would not engage with the clinicians during therapy sessions. He would move on to another activity if an activity required his engagement, and T often seem disinterested. The iPad seemed to be his escape from therapy when he was unable to leave the room. He would browse the apps and play games, rather than using it as a communication device. The clinician eventually learned to lock the iPad into the communication app, yet this just elicited frustration from T who would then just use the app, but not for communication. This was another example of how T lacked *engagement*, which assisted in learning to communicate (Gerber, 2003).

Effect of T's Weaknesses. All of these problems made it difficult for T to use the AAC system that he had been using. He was using the proloquo2go, which is a SGD run through an iPad. An example of this device can be seen in Figure 1.

T was using his device, but often times it was not a beneficial or appropriate means of communication. One example of this inappropriate use was a manipulation to be sent home from school early. T realized that many of the students were sick with the stomach flu, and did not have to come to school. He was able to use his device to tell the teacher that he felt sick and was sent home from school. According to his mother, he was not sick when they reached home and he seemed pleased to be home. This was a wonderfully communicate use of his device, just not a socially appropriate use. He also used his device to get out of therapy by asking for the restroom. The clinician made the decision to bring his AAC system down to a low-tech option to be less distracting. Part of T's lower tech AAC would be a main word grid that would contain essential vocabulary words that are helpful in everyday situations. The organization moved from left to right, with the columns being similar categories. The board included objects that he used in therapy sessions, emotions, and words related to tickling. There were also color-coded words for *yes* and *no*. This would be supplemented with another word grid that would contain words that were specific for an activity that the clinician planned for the day. This AAC system was a widely used low-tech system that based on the static display that could be pointed to by an individual to create a simple or complex message (Wegner, 2012). This static display was thought to be less distracting, which the clinician hoped would help during therapy. The main word grids can be seen in figures 2 and an example of an activity specific word grid can be seen in Figure 3.

This AAC system seemed to produce more communication than the iPad, but T did not make great advances in communication. He was also given some pictures to use to try and communicate; this did not help develop his communication any further than the other strategies. The pictures were placed around the room where T could see them and point to them if he wanted to communicate with the clinicians. Four pictures used for T are shown in Figure 4. Overall, the problems of sensory seeking, emotional regulation, and lack of motivation were blocking his ability to learn to communicate through his AAC system, and it will not be until these things are corrected that he will be able to start to learn communication skills.

T's Strengths

T often would show his understanding from a message modeled by the clinician, and would occasionally respond. Given the opportunity, and if T had the motivation, he was able to communicate with the clinician about an activity and share in joint attention. A great example of this was when the clinician would tickle T. The clinician knew that T liked to be tickled, so words related to tickling were included on the word grid. During one instance of tickling, T was able to use his word grid to indicate that he wanted the clinician to *tickle tummy*, after being prompted by the clinician. T was also able to do this in other activities, such as choosing when he wanted to go *fast* or *slow* in the purple canoe. This communication relies on the core vocabulary picked for T's AAC system (Beukelman & Mirenda, 2005). The clinician included useful words in order to allow T the best opportunities to communicate and engage him. This communication would not transfer over to less preferred activities, but it was a baseline for intentional communication.

Intelligence. T also showed great understanding and intelligence of the world around him. He was able to use his word grid without pictures, and would often understand spoken

instructions. Once, T went into a spelling application on his iPad and was able to perform advanced words and spelling. We knew that T had the *effort*, as described by Gerber (2003), to communicate. After getting past some of difficulties due to emotional regulation, which were described above as his “Weaknesses”, he was able to do activities in therapy with sequencing events from a book or recipe. His intelligence was present, but often, other problems would hinder his communication. We see his intelligence with the situation where he was sent home from school due to some manipulation of the situation. If T’s engagement is improved, he will have a better chance of learning to communicate through an AAC system.

With T, the saying “best laid plans of mice and men often go awry” describes the observations that were examined above. The clinician planned the therapy with the difficulties in mind and implemented an intervention program that seemed as though it would be successful, despite his difficulties. During rare instances, T would communicate with the clinicians and was able to preform during tasks.

Z Case Study: Playing Chopsticks

Z is a 7-year-old boy who had been diagnosed with autism at the age of 2 years and 6 months old. He came to the Truesdail clinic in November of 2015. He was nonverbal and was not currently using any AAC system. Z was born premature at 32 weeks gestation and presented with feeding issues after birth. These early issues may have given rise to some motor-planning difficulties. The mother reported that Z was a picky eater and seemed under-stimulated for taste. These factors, along with his infancy feeding issues, indicated the possibility of apraxia of speech, but he has not been assessed. Z was evaluated with the Westby Symbolic Play Scales to understand his language development through his representational play. The highest level of play demonstrated was Level III, which usually develops around 2 years old. Social communication

was also assessed using the SCERTS Assessment Program Observation Forms, Social Partner Stage. He was assessed in joint attention, mutual regulation, self-regulation, and symbol use. A majority of Z's communication is accomplished non-verbally, usually by pointing or physical manipulation. Z was found to be developing his communicative intent, which is an indicator that he would be a good candidate for AAC. Another strength found during assessment was his language comprehension. His mother reported that he often would follow simple spoken directions and reacted to tone of voice and facial expressions. These assessments introduced above outline Z's weaknesses in communication.

Z's Weaknesses

Z presents with some emotional regulation problems, which is fairly common in individuals with autism (Prizant et al., 2006). These difficulties were not as severe as the previous client, but were present. Z enjoys being outside on the playground, but this desire to be on the playground distracts him from therapy. Z would come into therapy upset about not going directly to the playground, often hitting his head with his fist. To reduce the unwanted behavior of self-harm, the clinician implemented several strategies; first, having a daily schedule visible, with the playground option at the end to indicate we would do it after everything was done and second, she imitated him when he hit his head and verbalized "ouch". The strategies helped diminish the time it took for Z to settle into the therapy session. These strategies allowed Z to have better emotional regulation (Prizant et al., 2006).

The clinician also implemented a board that contained graphics of emotions to allow Z to express his emotions to the clinicians. The strategy of expressing emotions is a recommendation from The SCERTS Model (Prizant et al., 2006). Figure 5 is the board of emotions used in therapy sessions with Z. By expressing his emotions, Z would become less frustrated with his

communication partner and learn the correct emotional response to his emotions (Prizant et al., 2006). The ability for him to express his emotions may also curb undesired behaviors due to his ability to communicate his emotions. The board was presented to Z during one therapy session. Z started to get very excited about tactile sensory stimulation, and then bounce his head off a large exercise ball. The clinician recognized that he was happy, but the action of him bouncing his head against the ball could be dangerous. It may help Z if he is able to communicate how happy or excited he is about the sensations he is feeling.

Z had some problems with engagement. He walked away from an activity that encouraged him to be engaged with others. This behavior was not as disruptive to therapy as his emotional regulation. The clinician did not allow Z to avoid engagement, interrupting his alone play with attempts to make him smile. Referring back to Gerber (2003), engagement is a very important aspect for learning language. Although Z did have occasional moments where he was not interested in engagement, he was often participating in activities with the clinicians.

Z mastered the ability to make single choices about different activities in different contexts. The clinician attempted to add in multiple choices at once and build on creating sentences from the graphics. This was more challenging for Z. He struggled to add on a second choice to create a more complex sentence. The clinician created an activity, which required Z to first choose a color for an Easter egg and then choose what object was inside of that Easter egg. Once he did this, he had to pick a location in the room to put the Easter egg. Z was unable to do this activity exactly, often just pointing to the color or the object. With more modeling, Z will hopefully understand what is trying to be conveyed and pick up the more complex sentences over time. The clinician lowered the number of choices as well as the complexity of the sentence to picking two graphics. He was success for one instance at picking two graphics in order to

make a complete sentence, which may just be an act of imitation, but it was a start to communicating more complex sentences.

Z Strengths

Z appeared to be motivated to communicate and successfully started indicating to pictures to make choices. Initially, he was shown two pictures that represented activities that were available to him, and he easily pointed or grabbed the picture of the activity he wanted. His motivation for communication was an indication that he was a good candidate for an AAC system. This motivation is part of the definition of communicative competence given by Light (1989) to determine if an individual should use an AAC. After Z was able to master the two-option choice, he moved on to more complicated strategies that were more than just a singular choice. The clinicians increased the number of choices Z was required to choose from. This included; the daily activities he could chose from (shown in Figure 6), the 4 colors of Legos (shown in Figure 7), which instrument he wanted (shown in Figure 8), and an activity specific choice board (shown in Figure 9). Even with all the multitude of choices, Z seemed to understand what he wanted and would indicate this to the clinician. Although Z's goal was to increase the complexity of his communication, his quick progress of choice making was impressive.

Z became dysregulated when he desired to go outside and would get frustrated when he was told him that he first needed to do work inside. This behavior to communicate displeasure served as a context to allow Z to express his emotions through the use of his picture communication board. This was a positive as he communicated his wants with no prompting. This just solidified his motivation to communicate with others.

Z's mother participated in the "More Than Words" (2011) program that was designed by Hanen. This program trained parents on how they could use strategies at home to work on communication with their child (*More Than Words – The Hanen Program for parents of children with autism spectrum disorder*, 2011). Z's mother was very motivated to use these strategies at home. She used pictures at home to help him communicate, which was recommended in the visual helpers chapter of the "More Than Words" book (Sussman, 1999). This work that the mother was doing at home helped Z be more successful at communicating in multiple contexts, at home and in therapy. Speech therapy does help an individual, but if they are able to get exposure to more of the same things at home and not just only at therapy, they will most likely have quicker progress.

Z would make vocal approximations during imitations of the clinicians or his mother in therapy. This occurred when the clinicians singing the "clean up" song indicated the end of an activity. He imitated the prosody of the song as well as attempted to make the same sounds. He also imitated some vocalizations during play on the swing. To create more opportunities for Z to imitate sounds, a drawing activity was created with sounds that were related to some drawing action. After a few, consistent, times doing this activity, Z would draw and make the noises on his own, though he preferred when others were doing the sounds with him. This imitation of sounds could be a sign that he could develop oral speech over time. With his history of possible motor problems it is not a current priority. Rather, increasing his communication through many modalities, including SGD, is the primary focus.

In addition to the graphic AAC system, a few manual signs were implemented for quick communication when his choices aren't readily available. These signs include ALL DONE, MORE, AND OPEN/CLOSE. The signs gave Z the ability to communicate during an activity

when his AAC system was out of reach or the word was not on a part of the AAC system. If Z desired that an activity end, then he could sign ALL DONE to indicate he wanted to do something else. During many activities, he was encouraged to use the sign MORE, in order to achieve a desired affect. This use of signs along with the pictures will create a more versatile communication system (Wegner, 2012). Z was able to use many of the signs after one or two prompts and continued using them throughout the activity. He does not yet use the signs spontaneously, but time will tell if the signs will become an active part of his communication system.

Z's Future

Z's future goals will focus on goals that are related to his expression through AAC and his engagement and pragmatic skills. His expressive goals are to expand his use of the current AAC system. The goal will be to use his AAC system to perform more advanced communicative functions, such as greetings, talk about past events, and story retell. The communicative functions will hopefully extend into the academic setting to support Z with his education. The hope is that Z will learn to use his AAC system spontaneously with no prompting.

In regards to his engagement and pragmatic goals, Z will increase the number of social communicative function. This could be achieved through the use of an AAC device, vocalizations, or gestures. This goal will increase Z's social interactions and work on improving his engagement with others. Another goal in the area of engagement is to participate in activities that will require shared attention. Z will be able to initiate communication when he desires to change activities or communicate when he is done with an activity.

If Z progresses with his communication and has the ability to create complex communicative messages, he may require a more advanced AAC system. The AAC would most

likely be some variety of SGD, for example, Proloquo2Go. It may be beneficial for Z to use a SGD in the future when his communication has reached more advanced levels, however, challenges could still arise. For the best possible success of Z's use of AAC, the SGD should be separate from any "play" electronics. When examining how T used his iPad as both a communication aid and a system to play games, he was distracted and would choose to play games rather than communicate. Z may be different, but in an attempt to prevent this outcome, it may be recommended that his SGD be a separate system from any other electronics he uses for fun.

Conclusion

This case study has examined the therapy sessions of two boys, both of whom have been diagnosed with autism. The first client was an example of when speech therapy alone cannot help a child communicate. There are factors associated with his autism, such as emotional dysregulation that interfere with him learning the correct skills to communicate. It is possible that if he were to improve his engagement and be motivated to communicate through enjoyable activities, an AAC system would be beneficial. Unfortunately, T did not make the progress in his communication that were set by his goals, and his goals were changed to a lower level during his time in therapy.

With the second child, the therapy focused on introducing him to an AAC system and matching him to the correct system in order for him to communicate more effectively. It was also important that his mother use strategies at home to promote his communication and have engagement. His mother was eager to use what she had learned through the Hanen program with Z. When parents are eager to help their children to communicate, it just reinforces what a speech language pathologist does in clinic. Z will continue on with his therapy until the session ends in

late April of 2016. Thus far, his progress with his AAC system has been astronomical and has made great progress with communication. He will continue on in the Truesdail clinic and develop his communication through the best AAC system possible for him.

This paper provided two situations, one in which an AAC system was unsuccessful and one that was very promising. The observations could provide some insight into what goes wrong or right when using an AAC for a child with autism. The observations are a qualitative view on the use of AAC and autism, but more quantitative studies should be done on the subject.

However, it is important to understand that every person has his or her own roadblocks that may interfere, and it is the job of the speech language pathologist to help the client find the best possible AAC system. A quantitative study may be conducted if there was a sample of the population that shared similar deficits. It is not guaranteed that the results will be applicable to a large number of the autism population. However, the studies may provide a backbone to therapy and insight into what may help a specific client, but the client's individual needs and difficulties will ultimately decide what is best for them.

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Figures

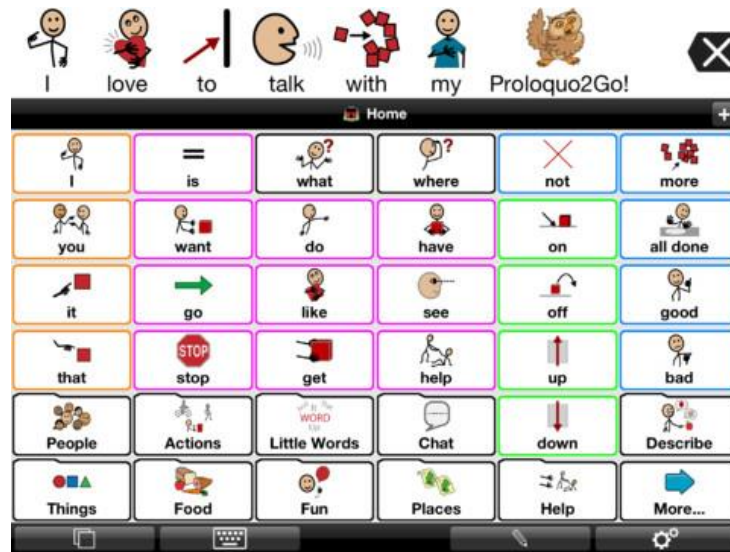


Figure 1: Proloquo2go Display

I	want	Purple Canoe	Happy	Rock	Arm
You	need	Sticker	Sad	Shake	Leg
We	have	Book	Angry	Fast	Foot
She	see	Tickle	Scared	Slow	Tummy
He	feel	Fun	Upset	Squeeze	Under arm
	like	Bathroom	Tired		Neck
No		Thank You		Yes	

Figure 2: Main Word Grid Developed for T

The	Witch	is	feels	hat	Happy
	cat	are		bow	Sad
dragon	dog	wanted	her	wand	Angry
Green	bird	lost		broken	Scared
	frog	helping	breathes	fire	Upset
	broom	looking		muddy	
No	animals		Bathroom		Yes

Figure 3: Example of an Activity-specific Word Grid



Figure 4: Pictures Used in Therapy Sessions for T

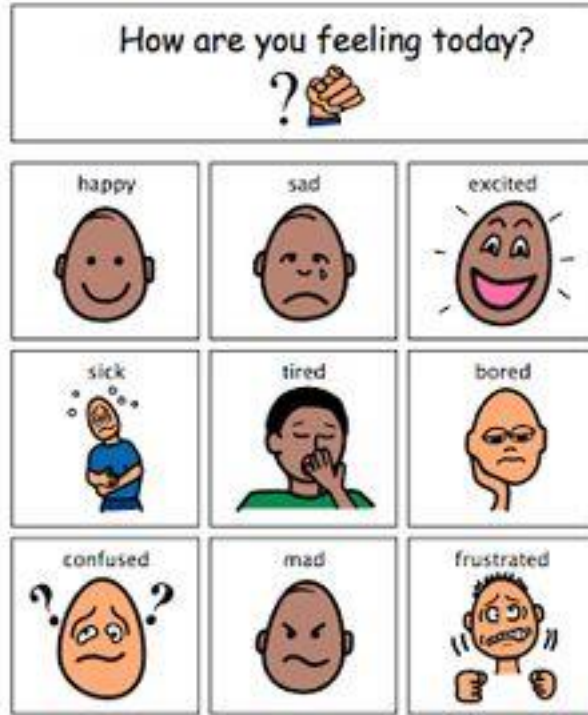


Figure 5: How Are You Feeling Board for Z



Figure 6: Activity Choices for Z During Therapy

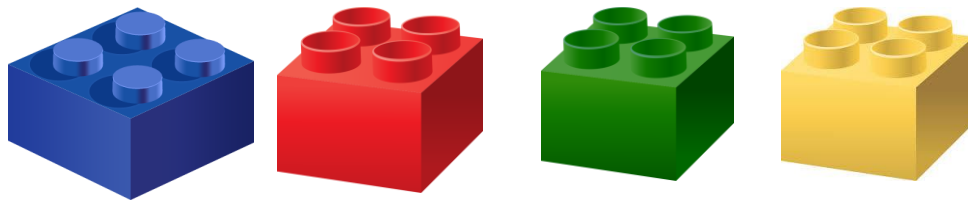


Figure 7: Lego Color Choices



Figure 8: Choices for Musical Instruments

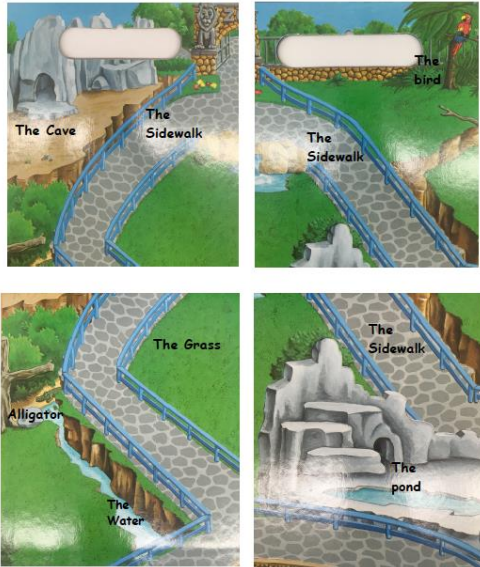


Figure 9: Magnetic Zoo Activity Location Choice Board