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Lack of Communication even when Using Alternative and Augmentative Communication Devices: are we Forgetting about the Three Components of Language

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Starting in the early 90s, augmentative and alternative communication (AAC) devices were introduced in special education classrooms. These devices were intended to replace the picture-based communication approaches, such as PECS (Picture Exchange Communication System).

The AAC devices were extremely expensive, difficult to program, and not flexible enough to accommodate needs. Parents and special education teachers believed that AAC devices were the solution for children with minimal communication skills if they could find funding and learn the skills to use them.

Recently, apps and low-cost mobile devices such as the iPad, iTouch, and Smartphones have opened opportunities for AAC solutions that can compete with dedicated devices and are affordable and intuitive to use. In July 2012, the Apple Store had listed approximately 250 apps under the keyword AAC with prices ranging from free to a few hundred dollars. The Android and Windows Mobile markets are also increasing the numbers of AAC apps every day.

In celebration, parents and professionals are now using AAC solutions with nonverbal and minimally verbal individuals with autism. However, even with the use of a technological solution that is easy to use, affordable and flexible, a large number of individuals with communication needs are still not learning how to communicate. We suggest that one of the reasons can be found in the lack of understanding that successful communication depends on the ability to manage the three main components of language: form, content, and use [1].

According to Bloom and Lahey (1978) research, form refers to the structure of the language and can include three overarching areas: phonology, morphology, and syntax. Phonology represents understanding of the sound system of language and production of meaningful words while morphology denotes the structure of words (understanding plural rules, how a prefix/suffix can change a word). Syntax relates to the rules of the language, such as grammar. The second main component is content which involves the meaning of the language and understanding the messages being produced. It is also referred to as semantics which is defined as understanding the meanings conveyed by words. The last component, use, refers to the varying functions of language. There are different purposes of language such as sharing ideas, being persuasive, expressing emotions, and asking questions, just to name a few [1].

Understanding form, content, and use is important because the chance of a breakdown in communication increases when one of these components is disrupted. For example, two individuals speaking a different language would demonstrate a disruption in form. Both could be addressing the same content, and could even have the same purpose for communication, but because neither individual is familiar with the rules or the sound systems of the other's language, they will not be able to communicate effectively. An example of a disruption in content would be when one word has a different meaning for two individuals.

The words in language are meaningless without the knowledge and memory of what they represent. If a person is from the United States, the word "football" describes a completely different game to someone from the United Kingdom. In both countries, English is the spoken language, but even with the same form, "football" has a different meaning. An example illustrating a disruption in use would be to consider a simple statement like "I have to go home." which can serve the function of giving information. With a small change in intonation, it can become a question with the function of seeking information such as "I have to go home?" This example illustrates that simple statements can take on big differences depending on the context and purpose. A lack of understanding of form, content and use can lead to communication breakdowns.

For children with autism, who are nonverbal or minimally verbal, the language form may consist of images or photographs. AAC solutions allow the form to be communicated in a way that others can understand (so it is not like two individuals speaking different languages). Unfortunately, teachers and parents often become complacent once the child begins to communicate and unknowingly dismiss increasing the language content and use. This oversight results in limited language development. If a child is not able to build vocabulary to include subjects, verbs, and other parts of speech, they will not be able to effectively communicate. For example, a phrase you might hear a child say is "I want hungry". This leads to a breakdown in communication, as the child does not have a clear meaning of the content to communicate that they are hungry or to ask for a specific kind of food. Normal language developmental milestones allow the child to creatively combine two-words together when only a 20-30 word vocabulary has been mastered. With a limited vocabulary yet a variety of lexicons, most young language learners easily create new phrases by mixing and matching. For example, when a child masters the name of several objects, the next step may be to learn a few verbs and descriptive words and then to combine them to transform the meaning (apple, cut apple, my apple, cut green apple).

Similarly, when use is not addressed in language development, children on the autism spectrum do not achieve communicative

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competence. Most AAC devices have been utilized so children can tell us what they want to eat, when they need to go to the bathroom, and what activity they want to do. Yet we are omitting the other functions of language, such as asking questions, sharing ideas, building relationships, and expressing emotions. Teaching the child to request may alleviate behavior challenges but will not assist in developing social relationships. Communication that can lead to improving social relationships includes the use of language to give information, seek information, comment, and a myriad of other functions.

An exhaustive search was run on the EBSCO host database through the Old Dominion University online library in order to locate research studies correlating form, content, and use with the language barriers in children with autism. All databases contained in EBSCO host were included and articles that cited Bloom and Lahey's 1978 publication entitled "Language Development and Language Disorders" were cross-referenced with the search term "autism." The goal of this search was to find the number of the scholarly articles published about autism that cited Bloom and Lahey's 1978 publication about language development, and more specifically referred to their theory of form, content, and use.

In conducting the search, eight scholarly articles were identified and only two specifically referred to the form, content, and use theory. Of the two articles, only one article did more than simply reference the theory and included a brief summary, which was also related to language development for individuals on the autism spectrum. It may be that researchers are utilizing other theories or variations of Bloom and Lahey's form, content, use, (which might explain why those articles did not show up in the search) or the results of this search could possibly indicate a gap that exists in the current research. The findings of this search may indicate that future research would benefit by utilizing the concepts discussed in the form, content, and use theory when developing speech and language interventions for individuals on the autism spectrum.

Many educators believe that there are pre-requisite cognitive skills that need to be demonstrated before an individual can learn to communicate. The National Joint Committee for the Communication Needs of Persons with Severe Disabilities [2], states that all individuals should be considered potential candidates for AAC solutions. We encourage parents and professionals to introduce AAC solutions as soon as possible in the lives of children with autism. A recent article showed that children who are minimally verbal would increase language skills

when using AAC [3]. Today's technology is integrated into all aspects of daily activities and will increase in the future. Being comfortable with technology will be important for students as they move through the educational system. Educators need to be ready and willing to use AAC solutions in the classroom.

Parents and professionals strive to find new research data for supporting and guiding their quest to help children communicate. Unfortunately, due to copyright regulations, only universities and research centers can access reliable information. Open access publications represent an opportunity to make peer-reviewed information available to the general population too.

Finally, we recommend three avenues for improvement. First, AAC devices should be used as early as possible at school and at home. Often, the introduction of these devices occurs at age five and, by that time many formative years of language development have passed. Second, we suggest that when working with children to improve communication, one remembers not only the language form, but also the integration of form, content, and use. Lastly, we suggest that a special focus be placed on the use of a language that expands beyond simply making a request.

AAC solutions have evolved greatly since the early 90s; they are easy to use, affordable, and adaptable. However, as professionals in the field and parents of children with autism, we need to evolve in how we are utilizing these devices and maximize their value by incorporating them as teaching tools for language development and not just a communication device.

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