

University of Nebraska - Lincoln

DigitalCommons@University of Nebraska - Lincoln

Special Education and Communication
Disorders Faculty Publications

Department of Special Education and
Communication Disorders

2021

Finding a Voice for Individuals With ASD Who Are Minimally Verbal Through Comprehensive Communication Assessment

Shelley Lund

Kristy Weissling

Wendy Quach

Miechelle L. McKelvey

Follow this and additional works at: <https://digitalcommons.unl.edu/specedfacpub>



Part of the [Special Education and Teaching Commons](#)

This Article is brought to you for free and open access by the Department of Special Education and Communication Disorders at DigitalCommons@University of Nebraska - Lincoln. It has been accepted for inclusion in Special Education and Communication Disorders Faculty Publications by an authorized administrator of DigitalCommons@University of Nebraska - Lincoln.

Finding a Voice for Individuals With ASD Who Are Minimally Verbal Through Comprehensive Communication Assessment

Shelley K. Lund,¹ Kristy Weissling,²
Wendy Quach,³ and Miechelle McKelvey⁴

1 Department of Communication Sciences and Disorders, University of
Wisconsin-Milwaukee WI

2 Department of Special Education and Communication Disorders, University
of Nebraska-Lincoln

3 Department of Communicative Disorders and Sciences, San Jose State
University, CA

4 Department of Communication Sciences and Disorders, University of
Nebraska-Kearney

Correspondence – Shelley K. Lund, sklund@uwm.edu

Abstract

Purpose: Many, but not all, children with autism spectrum disorder (ASD) have a difficult time communicating in conventional ways to express their decisions, preferences, and ideas. Augmentative and alternative communication (AAC) can fulfill many purposes of communication and support a child to achieve maximal self-determination and agency. The goal of assessment is not to fit the child to a particular device or communication strategy—but rather to identify the strategies that enhance the child’s strengths to maximize their independent communication and ultimately their ability to exert control over their world.

Published in *Perspectives of the ASHA Special Interest Groups*, vol. 6, pp 306-314 (April 2021).

doi:10.1044/2021_PERSP-20-00227

Copyright © 2021 American Speech-Language-Hearing Association. Used by permission.

Submitted September 1, 2020; revised December 16, 2020; accepted January 11, 2021.

This article is part of the Forum: Communication Choice and Agency: Thinking Beyond Spoken Language for Individuals on the Autism Spectrum.

Method: Our method was to combine results from our scoping review of the research literature, observations of videos of AAC assessments being conducted by specialists, and interviews with AAC experts (Lund, Quach, Weissling, McKelvey, & Dietz, 2017) and use these combined sources to extract overlapping themes. Finally, we completed an expert review of the results to verify their validity.

Results: There are 11 areas, which we found through our research, that should be included when assessing the communication and language skills of children with ASD who are minimally verbal. They are communication needs, current communication skills, language, cognition, symbol representation, sensory perceptual skills, motor skills, literacy, behavior, preferences, and system features.

Conclusions: It is important to embrace agency and choice throughout the assessment process. Having access to communication through AAC can give children with ASD a voice not only to express their choices but also to increase their self-determination.

The National Joint Committee for Communication Needs of Persons with Severe Disabilities affirms that everyone has the right to affect their existence through communication (Brady et al., 2016). Many, but not all, children with autism spectrum disorder (ASD) have a difficult time communicating in conventional ways to express their decisions, preferences, and ideas. Determining the number of children with ASD who are minimally verbal and may require augmentative and alternative communication (AAC) systems to meet daily communication needs is difficult to estimate. However, some data are available. Specifically, Lord et al. (2004) reported in a longitudinal study that 14.3%–19.8% of 9-year-old children with ASD were classified as nonverbal (i.e., using less than five words on a daily basis). An additional 9.5%–13.5% of 9-year-old children with ASD used five words on a daily basis but were not using three-word phrases. While this sample may include children with severe ASD, the numbers suggest that as many as 23.8%–33.3% of children with ASD at age 9 years may benefit from the use of AAC. More recently, the term *minimally verbal* has been used to describe these children. Specifically, a working group consisting of experts in the field of ASD and National Institutes of Health staff defined the minimally verbal child as having a very small repertoire of spoken words that are used communicatively (Kasari et al., 2013). Although the number of spoken words in the child's vocabulary may vary, the hallmark of this group is that they use spoken language in restricted settings and for limited purposes. Often, the words that the child uses have been taught in routine and scripted contexts.

With limited use of generative speech, many minimally verbal children rely on unconventional behaviors to communicate (Iacono & Caithness, 2009). This lack of conventional communication may affect how an individual with autism is able to demonstrate their agency. Agency is the ability to exert personal power independently (Merriam-Webster, n.d.; Schlosser, 2019). Human agency is, in fact, a core principle of social science and is a complex and multifaceted concept (Schlosser, 2019; Parsell et al., 2017). Communication of one's desires and actions is central to agency. It is through communication that a person demonstrates not only their wants, needs, and desires but also their reasoning for such.

The use of AAC may assist those with complex communication needs and ASD to demonstrate their agency in the absence of natural speech output. Many purposes of communication can be met through the use of AAC. Critical to the success of AAC interventions for individuals with complex communication needs is the recommendation of appropriate AAC systems, which allow for communication that promotes personal agency (Johnson et al., 2006). However, research on AAC assessment is sparse. Previous research has shown that many SLPs are uncomfortable conducting AAC assessments, especially if it is something that they do infrequently (Dietz et al., 2012; Marvin et al., 2003). Our team has been studying AAC assessment practices in an effort to develop materials to assist SLPs to conduct these assessments. For the purpose of this clinical focus article, we will present our findings through the lens of agency in those with complex communication needs and ASD.

It is important to embrace agency and choice throughout the assessment process. Having access to communication through AAC can give children with ASD a voice not only to express their choices but also to increase their self-determination. A core principle of assessment in AAC and ASD is meeting the child where they are so that we are able to find the best communication strategies and systems for them. As we approach assessment, clinicians should be well aware of their biases and how they might influence the assessment process. These biases include, but are not limited to, preferences for particular vocabulary organization, software, hardware (e.g., choosing an application on an iPad over a dedicated system), informal methods of assessment, or standard methods of assessment. If we are committed to conducting

assessments that will lead to agency in the child with ASD, clinicians will be careful to set aside potential biases and listen to desires of the child and those with whom they interact. The priority of AAC assessment is finding a communication system that works well for the individual with complex communication needs and their families while assuring that the prescription of the system leads to maximal self-determination for the child. The goal of assessment is not to fit the client to a particular device or communication strategy—but rather to identify the strategies that enhance the client’s strengths to maximize their independent communication and ultimately their ability to exert control over their world.

Beukelman and Mirenda’s Participation Model (1988) is the theoretical framework upon which much AAC assessment is based. The model emphasizes the assessment and treatment of the capabilities of the individual with AAC needs, but it also encourages the consideration of factors outside the abilities of the individual (i.e., Opportunity Barriers). In this part of the assessment process, the clinician is concerned with identifying the barriers that are limiting communication and participation outside of the skills and abilities of the client. The model identifies several opportunity barriers that should be taken into account during AAC service delivery including assessment. One set of barriers in the model are policy barriers. These are laws or policies that restrict access to communication and participation. Policies that exclude AAC services from reimbursement for certain conditions are one example. A second set of barriers, practice barriers, are restrictions not enforced by law or policy but are a result of common clinical practice. A school system that only purchases one brand of AAC software for all students regardless of the students’ needs creates a practice barrier. Third, knowledge barriers result from a lack of information and education about AAC. Whereas, skill barriers occur when there are challenges with applying technical skills that allow for positive teaching and interactions with individuals who use AAC even though clinicians have AAC knowledge. Last, attitude barriers can be the most pervasive, as they involve misconceptions and biases about clients’ abilities that can limit what we believe and expect from them. All of these opportunity barriers prevent children with ASD from expressing themselves at their optimal level and may prevent them from becoming agents of choice in their own lives. Opportunity barriers

may inhibit agency in children with ASD by restricting access to services, equipment, knowledge, skills, and attitudes that would provide for that agency.

Assessment Research

Through our work, we have reviewed the literature in AAC assessment for children with ASD, observed AAC specialists conducting assessments, and interviewed AAC specialists about assessment. Our method was to combine results from our scoping review of the research literature, observations of videos of AAC assessments being conducted by specialists, and interviews with AAC experts (Lund, Quach, Weissling, McKelvey, & Dietz, 2017) and use these combined sources to extract overlapping themes. After we had distilled overlapping themes, we completed an expert review of the results to verify their validity. We have disseminated this information to this point through a series of presentations (Lund, Quach, Weissling, & McKelvey, 2017; McKelvey, et al., 2018; Quach et al., 2018; Weissling et al., 2017). The next step is feasibility testing of the resulting AAC assessment protocols. Our work has focused in four areas: cerebral palsy (a primary motor disorder in children), autism (a developmental social/language disorder), aphasia (an acquired language disorder), and amyotrophic lateral sclerosis (an acquired motor disorder). The focus of this clinical focus article will be the compilation of what we have learned about AAC assessment in ASD. Our purpose is not to detail our methods as those will be revealed in upcoming papers with more precise results. Rather, our purpose is to distill clinically useable information for clinicians. Specifically, there are 11 areas that we found should be included when assessing the communication and language skills of children with ASD who are minimally verbal. These areas are communication needs, current communication skills, language, cognition, symbol representation, sensory perceptual skills, motor skills, literacy, behavior, preferences, and system features. These areas are discussed in the following sections and are summarized in Table 1. Examples of methods to assess each area are also provided; however, this is not meant to be an exhaustive list. Muller et al. (2020) suggest that “gold standard” assessment for minimally verbal children

with ASD should include a combination of observation, direct assessment (i.e., interacting directly with the child), and indirect assessment (i.e., using informants to gather information). Both direct and indirect assessments can use norm-referenced, criterion-referenced, or informal measures.

Communication Needs

Assessing communication needs is the first step of the Participation Model (Beukelman & Mirenda, 1988). The objective of this area of assessment is to determine the individual's current and anticipated communication needs, and identify which needs are being met and which ones are not. Assessing communication needs includes determining when, where, why, with whom, and about what the individual needs to communicate. It is also important to identify communication opportunities and opportunity barriers. Methods to assess communication needs include interviewing the client and significant others, using communication needs surveys, or conducting ecological inventories. Ecological inventories are systematic observations of the individual in naturally occurring situations throughout the day (Sigafoos & York, 1991). The purpose of the inventory is to note the communication needs of the individual and how they are participating in relation to typically developing peers. The information gleaned from this part of the assessment will be used to determine what vocabulary should be added to the AAC system to help the individual meet their unmet communication needs.

As we consider the agency of children with ASD, it is important whenever possible to get firsthand information about communication needs. This might be accomplished by observation of behaviors that get desired results, rating scales that allow the child to show us their preferences about potential messages, observation of undesirable behaviors and analysis of their meaning, and through sorting or ranking tasks. An example of a sorting task would be to give a child pictures that depict potential communication needs (e.g., people, topics, and settings) and have them sort the pictures into "Yes, I need this" or "No, I don't need that." Alternatively, the child could place the pictures in the order of most important to least important (i.e., rank). While accounts of "others" who are involved with the child tell us their

Table 1. Themes of assessment for children with autism spectrum disorder who are minimally verbal.

<i>Area</i>	<i>Definition</i>
Communication needs	Information about current and anticipated areas where communication is less than optimal and additional support is needed
Current communication skills	The child's current mode of communication, frequency of communication, turn-taking patterns, and communicative functions
Language	The child's receptive and expressive skills in semantics, syntax, and morphology
Cognition	The child's learning style, functioning level and intellectual potential, cognitive organization, or knowledge of category structure
Symbol representation	The type of symbols that can be understood by the individual and used expressively
Sensory perceptual skills	The child's vision, hearing, and other sensory preferences/aversions
Motor skills	The child's ability and accuracy in accessing AAC systems or producing signs and gestures
Literacy	The child's ability to read and write
Behavior	The forms and functions of unconventional or challenging behaviors
Preferences	Information about reinforcers, interests, and preferred activities
System features	AAC system features that are most important and preferred for the child to be a successful communicator (e.g., display size, portability, durability)

AAC = augmentative and alternative communication.

impression of what the child with autism wants/needs to communicate and can be valuable, firsthand information is most likely to promote the agency of individuals with autism.

Current Communication Skills

This area includes assessment of the child's current mode of communication, frequency of communication, turn-taking patterns, and communicative functions. Assessment of current communication skills was often discussed with reference to the Participation Model (Beukelman

& Mirenda, 1988) because describing the individual's current methods of communication is an integral part of the model. Additional rationale for assessing current communication skills and pragmatic skills included determining if the individual has an understanding that their behavior has the potential to influence others (Mirenda & Schuler, 1988). This understanding is central to the idea of agency. When the child understands that their behavior can cause action, their independence and desires are revealed. However, if the adults who observe the child do not recognize the current communication abilities and use them to develop more conventional avenues, agency may be lost.

Most often, information about current communication skills is obtained through observation and interviewing informants; however, some standardized, criterion-referenced measures such as Social Networks (Blackstone & Hunt Berg, 2003) or the Communication and Symbolic Behavior Scales (Wetherby & Prizant, 2002) can be used to evaluate these skills.

It is important to observe the child's communication with and without AAC and describe how AAC strategies change the child's communication. Observing both conditions can help the clinician to form a list of potential AAC strategies and systems. These systems may include both high-tech (i.e., electronic) and low-tech (e.g., books, boards, picture exchange) methods. Throughout the assessment, it is important to focus on the child's strengths and what can be enhanced rather than the child's limitations. At this level of assessment, it is important to observe those behaviors that are communicative in nature and to respond to the child's attempts at agency. Describing the child's current communication skills (i.e., a communication signal inventory) serves to create a communication system for today and provides opportunities for shaping of new conventional communication behaviors for expanded agency in the future (tomorrow; Beukelman & Light, 2020). An example of this would be to provide whole messages (e.g., "It's my turn") to meet a child's today's needs for circle time while teaching the use of core vocabulary for a future field trip.

Language

Understanding the receptive and expressive language of children with autism may help in determining the AAC system organization and

vocabulary. Assessing receptive language is important to determine the type of spoken language input that is appropriate for the child and whether comprehension could be supported with augmented input strategies such as visual schedules and other visual representations of language (Beukelman & Light, 2020). Receptive language skills, such as the ability to respond to commands with and without situational or nonverbal cues, to comprehend single word vocabulary, morphology, and different simple and complex sentence types, should be assessed. The methods described in our research to assess receptive language included standardized tests such as the Peabody Picture Vocabulary Test (Dunn, 2019) or the Test of Auditory Comprehension of Language (Carrow-Woolfolk, 2014). When using norm-referenced tests, standard scores are often of little use due to floor effects; however, raw scores may be useful to plot changes over time (Kasari et al., 2013). Additionally, systematic observations and informal, clinician-constructed tasks were also discussed in the literature (Light et al., 1998). An example of a clinician-constructed task may include providing pictures of vocabulary identified by the family as familiar and asking the child to point to the item named or following directions provided by the clinician. Understanding of receptive language skills may lead to augmented input strategies, a better understanding of syntactical potential for system organization, and assisting the clinician in understanding the type and level of vocabulary that the child will be successful with.

It is important to assess not only the child's language comprehension but also how AAC strategies can support the child's expressive language. Many children with complex communication needs and ASD may struggle to complete standardized tests of expressive language. Rather than assessing their static skills at a given point in time on a standardized measure, dynamic assessment strategies can be used to describe how the child learns to use AAC to support their expression. For example, clinicians can use familiar vocabulary and syntax and scaffold the child's performance to more complex language forms, taking note of the strategies and cues that were most beneficial for the child. Using a preferred activity and prepared communication displays that organize, store, and release messages in a variety of ways is one avenue for this dynamic assessment to be accomplished. For example, one display may have messages stored as whole phrases or sentences

(e.g., this is fun, please help me, I need the glue) and another display would require the child to combine symbols (semantic–syntactic display) to communicate a message (e.g., “I need,” “I like” “glue” “paper” “red”). The clinician would model the use of the communication display during the activity and note if the child begins to use the symbols without cueing. If they do not, the clinician would provide cues to scaffold their participation (e.g., gesture toward the communication board, point to the appropriate symbol that the child should use to provide a physical prompt). Data collection over a few sessions can help the clinician decide what vocabulary should be included in the AAC system, how it should be organized, and the best instructional strategies to use during intervention.

Cognition

In addition to understanding the language abilities of the child with ASD, assessment of cognition may help clinicians to determine the organizational layout of the AAC system. Making determinations about the child’s learning style will also help in planning the type of intervention that will be most advantageous (e.g., milieu teaching, direct instruction, modeling, pragmatic instruction, strategy instruction, coaching, prompting).

Standardized test results may provide information about the child’s functioning level and intellectual potential, which may provide a context for interpreting other language and communication skills. However, it is important to note that there are few standardized measures that will truly reflect the cognitive functioning of a child with ASD. Formal test results need to be supplemented with dynamic assessment and observation to assess the child’s learning style. Assessing the child’s cognitive organization or knowledge of category structure when combined with information about receptive and expressive language abilities may help guide the organization of vocabulary in the individual’s AAC system.

Dynamic assessment is often accomplished over the course of a few sessions. Clinicians may prepare communication displays (both high and low tech) that require the child to navigate through multiple pages using categorical (e.g., people, places, actions) or episodic (e.g., by time morning, afternoon, evening) organizational tabs. On high-tech

systems, a clinician may create a home page that shows the different activities prepared for the assessment (e.g., bubbles, train, Legos, art, snack) and track the ability of the client to use the home page to find more specific vocabulary. The vocabulary for each activity is provided on a separate page, and this type of dynamic assessment can assess memory, permanence, navigation, and symbolic ability.

When these more wholistic activities fail to produce positive results, it may be helpful to use matching and sorting activities to determine the child's conceptualization of content (concept, propositions, schemata). Information about their categorization skills may be useful in understanding how to organize the vocabulary in an AAC system. Informal sorting tasks that require the child to group similar items or engage in simple matching tasks may reveal areas of strength and areas for further instruction. Accurate and valid assessment of cognitive skills helps assure that we understand the level of decision making and agency a child has the ability to employ.

Closely related to the area of cognition is the evaluation of development. Assessment of overall developmental level and adaptive behavior was described across our data collection methods. The rationale given for using a global measure of development or adaptive behavior was to gain a functional description of the child's skill rather than an IQ score. Formal measures were used in the research literature to assess this area. This was usually completed in treatment studies, which used this information to describe study participants. However, the frequency of their use in daily clinical practice has not been determined. Measures of functional skills used included The TARC Assessment Inventory for Severely Handicapped Children (Sailor & Mix, 1975), the Adaptive Behavior Inventory (Brown & Leigh, 1986), and the Vineland Adaptive Behavior Scale (Sparrow et al., 2005). Research studies also used the Childhood Autism Rating Scale (Schopler et al., 2010) to describe the severity of the children's autism.

Symbol Representation

The goal of symbol assessment is to determine the type of symbols that can be understood by the individual and used expressively. Dynamic assessment using a teach/test paradigm (Light et al., 1998; Miranda & Schuler, 1988) or informal procedures such as matching tasks

(Null, 2008) and observing how readily the child learns to use symbols within a communication system (Mirenda, 2002) can be used for this purpose. In a matching task, the child is provided with an object and two or more symbols, and then asked to match the object to the symbol using a functional response mode such as pointing. Teach/test activities utilize vocabulary known to the child and introduces new symbols corresponding to these familiar vocabulary. Once these symbols are taught, the clinician tests the child's ability to use the symbols during a communicative task (e.g., shared book reading). Additional formats that have been suggested in the literature include receptive labeling, yes/no format, visual matching format, functional requesting, and functional question-answer format. These are reviewed in Beukelman and Light (2020). Additional information can be found at http://literacy.nationaldb.org/files/2313/6380/0466/Symbol_Assessment_Guidelines.pdf. Assuring that the symbol system we have assigned to the AAC system matches the abilities of the child ensures maximal communication and expands the child's ability to communicate about their internal preferences and feelings.

Sensory Perceptual Skills

Sensory perceptual assessment is necessary to determine if the child's vision or hearing would affect the selection of AAC systems or intervention. If there are any concerns about the child's vision, functional assessment using AAC materials may be conducted to determine the size, spacing, arrangement, and positioning of symbols on the communication system.

The evaluation may be performed using low- or high-tech materials. Clinicians evaluating this area should create a variety of boards to evaluate the following: symbol size, spacing, and color contrast. Clinicians may need to consult with an occupational therapist, other professionals, or parents/caregivers to determine if the child has other sensory issues that may affect the selection of an AAC system. Sensory access to AAC systems is vital for independence in communication and will open the door to the child's ability to affect the environments in which they function. This is an important consideration in assessment that promotes agency.

Motor Skills

Although children with ASD typically do not have significant motor limitations, it is important to consider how the child will access the AAC system. Motor skill assessment should be conducted to determine access methods for aided AAC systems or the accuracy of hand movements to produce manual signs or gestures. If detailed evaluation of motor skills is needed, it is important to consult with an occupational or physical therapist to trial different access methods and display characteristics such as symbol size and spacing.

Literacy

There are two reasons to assess literacy: to determine if printed words are an appropriate way to represent meaning in the AAC system and to determine the child's level for literacy instruction. It is important to address literacy in children who use AAC. Literacy is a skill that will open up generative communication (i.e., the ability to combine letters into an infinite number of messages). Without it, individuals must make do with the symbolic vocabulary provided to them. With the many needs of children with ASD, literacy instruction could easily be set aside while other more challenging needs are addressed (e.g., behavior, social interaction). Specific literacy skills to assess include emergent literacy skills such as concepts about print and alphabetic knowledge (Foley & Staples, 2003). Higher level literacy skills including letter-sound correspondence, phonological awareness, single word reading, reading comprehension, and spelling should also be considered (Beukelman & Light, 2020). Adaptations of formal and informal tools can be used to assess phonemic awareness, letter-sound correspondence, word identification, text comprehension, and developmental spelling (Foley & Staples, 2003; Iacono & Caithness, 2009). Clinicians are encouraged to assess the use of low- and high-tech AAC strategies to allow for the development of literacy skills. For example, literacy instruction may include a phonological awareness task such as having the child point to a picture that represents the target sound provided. For a more complete review of AAC and literacy instruction, readers are encouraged to consult Light and McNaughton (2020) and Erickson

and Koppenhaver (2020). In turn, the generative communication that results will promote self-determination and independence in the communication of unique messages.

Behavior

Many children with ASD use unconventional behavior to communicate. It is important to document the forms and functions of unconventional or challenging behaviors, with the goal of replacing these behaviors with appropriate communication. According to Iacono and Caithness (2009): “Functional analysis of behaviors that are problematic, such as ritualistic behavior, aggression, and self-injury are also critical in informing interventions that may incorporate the use of functional communication training” (p. 36). Informal methods such as using checklists to structure observations (Paul & Wilson, 2009) or interviews with key informants (Iacono & Caithness, 2009) have been described in the literature. It is important to respect behavior as a form of communication and as an expression of agency. While a particular behavior may be self-injurious or aggressive, it often arises because of the child’s desire to have agency in their environment in the face of limited communication skills.

Preferences

In addition to identifying potential reinforcers, information about interests and preferred activities can assist in identifying goals for the child (Iacono & Caithness, 2009). It is often important to determine what activities and objects are motivating for the child and can encourage communication. Restricted interests may be a challenge for those with ASD, but it is incumbent upon clinicians to help individuals with ASD explore their interests. New interests may be an extension of familiar and comfortable ones. Agency is revealed when individuals enjoy the activities in which they are engaged but are also encouraged to explore new ideas. Informal methods for assessing preferences found in the literature included interviewing parents (Ben Chaabane et al., 2009) and using checklists (Soorya, 2004). Observation and analysis of key behaviors of the child with ASD should also be used to guide preferences. The clinician may consider what characteristics

of preferred activities might be shared by new unexplored activities. For example, if a child is highly motivated by trains, the clinician may explore other modes of transportation as an area of interest. That is, what are the characteristics of this activity that are shared by others that might be developed? As previously discussed, firsthand observation promotes agency and may prevent secondhand information (information from other people) from hindering the self-determination of the child. Using materials that the child prefers not only encourages engagement—it empowers the child.

Sigafoos et al. (2012) described a procedure that allows the person with ASD to show their preference for which modality or device they prefer to use for their communication. Some individuals had strong preferences as to how they would like to communicate; therefore, it is important that we honor these preferences. Providing opportunities to make choices and valuing the choices that the child makes is an important first step to respecting the desires of children with ASD.

System Features

When selecting AAC systems, the clinician must take the information gathered from assessing the client's skills and identify the features that are needed in an AAC system. It is then incumbent on the clinician to evaluate the client's use of these features. It is rare that a single AAC device will encompass all of the ideal features for a child with ASD; therefore, decisions must be made as to which features are most important for the child to be a successful communicator and which features are preferred by the child. Although many children with ASD have an affinity for technology, this factor alone does not suggest a high-tech approach be pursued. It is critical to consider the child's communication needs and capabilities. Provision of a high-tech system does not mean the child's communicative competence will automatically improve (Beukelman & Light, 2020; Mirenda & Schuler, 1988). Other factors that may influence the selection of high-tech versus low-tech systems include portability, appearance, and durability. Portability refers to the size and weight of the system but also to how the child will transport it. Some children with ASD may need to be taught to carry their AAC system. Clinicians may need to consider the durability of the equipment if the child exhibits behaviors that may damage it.

Regardless of whether a high- or low-tech system is selected, the types of symbols, vocabulary included, and organization of that vocabulary (Mirenda & Schuler, 1988; Wilkinson & Rosenquist, 2006) need to be considered. When selecting low-tech systems, it is important that the symbols used are intelligible to the communication partner or labeled in a manner that will easily convey the child's desired message because there is not the benefit of the message being spoken out loud (Mirenda & Schuler, 1988).

In aided AAC systems, there is a limited amount of physical space to display the symbols that an individual needs to communicate. Therefore, decisions about what vocabulary items to include and how to organize them become vitally important. Consulting the results from the assessment of communication needs and language skills will aid the clinician in determining the nature of vocabulary needed by the child. Core vocabulary are words and messages that are commonly used by many individuals and frequently occur across contexts. Fringe vocabulary refer to vocabulary words and messages that are specific or unique to an individual (e.g., names of specific people, locations, and activities as well as preferred expressions). These words personalize the vocabulary in the AAC system and allow expression of ideas and messages that are not in core vocabulary lists. Children with ASD may benefit from having words or phrases to facilitate social interaction included in their communication system. For example, "Want to hear a joke?" could be programmed on the child's system to initiate a conversation.

Determining the length of messages needed (i.e., word- or phrase-based) is also important. This decision will be based on the communication needs of the child and their ability to combine symbols into novel messages. The system does not have to be composed of only word- or phrase-based messages. A combination of single words and phrases is often the most effective (Beukelman & Light, 2020). It is also important to estimate how the child's language will develop once they begin using an AAC system. This will guide the decision about how much room for growth and expansion will be needed to accommodate the child's language development. Finally, the clinician must consider what rate enhancement strategies would be beneficial for the child. For example, whole message storage and release may help the child to engage in social interactions more quickly than word by word

(e.g., core) approaches. Many children with ASD will have to rely on others to determine the vocabulary that is included in their communication system. It is critical that this vocabulary reflects the individual characteristics, personality, and preferences of the child because it is through this vocabulary that the child is able to express agency. Some of the techniques previously discussed (i.e., ranking, sorting) can be used to determine the vocabulary preferences of the child. For example, multiple greetings (e.g., What's up?; How you doin?; Hello) are provided to the child who then ranks the greetings they prefer. We must include the child as much as possible in the decisions regarding vocabulary selection.

Because symbols must be displayed within a constrained physical space, the characteristics of the array are important. The child's vision, motor skills, and cognition will all influence characteristics of the display. Clinicians should consider the size of the symbols, the number of symbols per page, and spacing between symbols. To accomplish this, the clinician can create layouts that vary across the aforementioned variables and use dynamic assessment procedures to track the amount and type of cueing needed by the child to use the various arrays.

Conclusions

Another way of providing agency and self-determination for our clients is through advocacy. One of the responsibilities in providing AAC services is to "Advocate for individuals and their families/caregivers at the local, state, and national levels, particularly with regard to funding, education, and acceptance of AAC use" (American Speech-Language-Hearing Association, n.d.). Eliminating opportunity barriers that limit access to communication is critical. Assessing communication and language skills and providing an individual with a communication system is only the first step. We must provide effective, evidence-based intervention to teach our clients to have agency, express their choices, and develop self-determination. This requires that we act as advocates for our clients as well as teach them the skills they need to become self-advocates.

AAC assessment is a complex process. When the clinician overlays the lens of agency and choice on this process, the result may be more

functional, teachable, and desirable for all those involved. As clinicians, it is easy to select procedures and interpret results that promote our own sense of self rather than considering the agency of the clients we serve. We need to view AAC assessment through the lens of agency and self-determination: What are an individual's behaviors telling us about their preferences? What is their communication telling us? What is their progress telling us? It is only through this lens that we are able to provide client-centered services that impact communication, self-determination, and life participation. The idea of giving agency challenges us to work harder and get outside of our own boxes. Are we up for the challenge?

Acknowledgments A portion of the contents of this clinical focus article were developed under a grant from the Department of Health and Human Services, National Institute of Disability, Independent Living, and Rehabilitation Research Grant 90IF0061, Optimal Augmentative and Alternative Communication Technology for Individuals with Severe Communication Disabilities: Development of a Comprehensive Assessment Protocol. However, this content does not necessarily represent the policy of the Department of Health and Human Services, and you should not assume endorsement by the Federal Government.

Disclosures The authors have no relevant financial or nonfinancial interests to disclose.

References

- American Speech-Language-Hearing Association. (n.d.). *Augmentative and alternative communication (Practice Portal)*. Retrieved December 3, 2020, from <http://www.asha.org/Practice-Portal/Professional-Issues/Augmentative-and-Alternative-Communication/>
- Ben Chaabane, D. B., Alber-Morgan, S. R., & DeBar, R. M. (2009). The effects of parent-implemented PECS training on improvisation of mands by children with autism. *Journal of Applied Behavior Analysis*, 42(3), 671-677. <https://doi.org/10.1901/jaba.2009.42-671>
- Beukelman, D. R., & Light, J. (2020). *Augmentative & alternative communication: Supporting children and adults with complex communication needs* (5th ed.). Brookes.
- Beukelman, D. R., & Mirenda, P. (1988). Communication options of persons who cannot speak: Assessment and evaluation. In C. A. Coston (Ed.), *Proceedings of the National Planners Conference on Assistive Device Service Delivery* (pp. 151-165). Association for the Advancement of Rehabilitation Technology.

- Blackstone, S., & Hunt Berg, M. (2003). *Social networks: An assessment and intervention planning inventory for individuals with complex communication needs and their communication partners*. Augmentative Communication.
- Brady, N. C., Bruce, S., Goldman, A., Erickson, K., Mineo, B., Ogletree, B. T., Paul, D., Ronski, M. A., Sevcik, R., Siegel, E., Schoonover, J., Snell, M., Sylvester, L., & Wilkinson, K. (Eds.). (2016). *Communication services and supports for individuals with severe disabilities: Guidance for assessment and intervention*. *American Journal on Intellectual and Developmental Disabilities*, 121(2), 121–138. <https://doi.org/10.1352/1944-7558-121.2.121>
- Brown, L., & Leigh, J. E. (1986). *Adaptive behavior inventory*. Pro-Ed.
- Carrow-Woolfolk, E. (2014). *Test of Auditory Comprehension of Language-Fourth Edition (TACL-4)*. Pro-Ed.
- Dietz, A., Quach, W., Lund, S. K., & McKelvey, M. (2012). AAC assessment and clinical-decision making: The impact of experience. *Augmentative and Alternative Communication*, 28(3), 148–159. <https://doi.org/10.3109/07434618.2012.704521>
- Dunn, D. M. (2019). *Peabody Picture Vocabulary Test* (5th ed.) [Measurement instrument]. NCS Pearson.
- Dunn, L. M., & Dunn, D. M. (2007). *Peabody Picture Vocabulary Test-Fourth Edition (PPVT-4)*. Pearson Education, Inc. <https://doi.org/10.1037/t15144-000>
- Erickson, K. A., & Koppenhaver, D. A. (2020). *Comprehensive literacy for all: Teaching students with significant disabilities to read and write*. Brookes.
- Foley, B. E., & Staples, A. H. (2003). Developing augmentative and alternative communication (AAC) and literacy interventions in a supported employment setting. *Topics in Language Disorders*, 23(4), 325–343. <https://doi.org/10.1097/00011363-200310000-00007>
- Iacono, T., & Caithness, T. (2009). Assessment issues. In P. Mirenda (Ed.), *Autism spectrum disorders and AAC* (pp. 23–48). Brookes.
- Johnson, J. M., Inglebret, E., Jones, C., & Ray, J. (2006). Perspectives of speech language pathologists regarding success versus abandonment of AAC. *Augmentative and Alternative Communication*, 22(2), 85–99. <https://doi.org/10.1080/07434610500483588>
- Kasari, C., Brady, N., Lord, C., & Tager-Flusberg, H. (2013). Assessing the minimally verbal school-aged child with autism spectrum disorder. *Autism Research*, 6(6), 479–493. <https://doi.org/10.1002/aur.1334>
- Light, J. C., & McNaughton, D. B. (2020). Literacy intervention for individuals with complex communication needs. In D. R. Beukelman & J. C. Light (Eds.), *Augmentative and alternative communication: Supporting children and adults with complex communication needs* (5th ed.). Brookes.
- Light, J. C., Roberts, B., Dimarco, R., & Greiner, N. (1998). Augmentative and alternative communication to support receptive and expressive communication for people with autism. *Journal of Communication Disorders*, 31(2), 153–180. [https://doi.org/10.1016/S0021-9924\(97\)00087-7](https://doi.org/10.1016/S0021-9924(97)00087-7)

- Lord, C., Risi, S., & Pickles, A. (2004). Trajectory of language development in autistic spectrum disorders. In M. L. Rice & S. F. Warren (Eds.), *Developmental language disorders: From phenotypes to etiologies* (pp. 7–29). Erlbaum.
- Lund, S. K., Quach, W., Weissling, K., & McKelvey, M. (2017, November). *Augmentative and alternative communication clinical assessment project: Protocol for assessment of children with autism*. 1-hour seminar presented at the American Speech-Language-Hearing Association Convention, Los Angeles, CA, United States.
- Lund, S. K., Quach, W., Weissling, K., McKelvey, M., & Dietz, A. (2017). Assessment with children who need augmentative and alternative communication (AAC): Clinical decisions of AAC specialists. *Language, Speech, and Hearing Services in Schools, 48*(1), 56–68. https://doi.org/10.1044/2016_LSHSS-15-0086
- Marvin, L. A., Montano, J. J., Fusco, L. M., & Gould, E. P. (2003). Speech-language pathologists' perceptions of their training and experience in using alternative and augmentative communication. *Contemporary Issues in Communication Science and Disorders, 30*(Spring), 76–83. https://doi.org/10.1044/cicsd_30_S_76
- McKelvey, M., Weissling, K., Quach, W., & Lund, S. (2018, November). *Augmentative & alternative communication clinical assessment project: Protocol for assessment of individuals with ALS*. Seminar at the ASHA annual convention, Boston, MA, United States.
- Merriam-Webster. (n.d.). *Agency*. In Merriam-Webster.com dictionary. Retrieved July 23, 2020, from <https://www.merriam-webster.com/dictionary/agency>
- Mirenda, P. (2002). Augmentative and alternative communication systems. In A. Bondy & L. Frost (Eds.), *A picture's worth: PECS and other visual communication strategies in autism* (pp. 43–66). Woodbine House.
- Mirenda, P., & Schuler, A. L. (1988). Augmenting communication for persons with autism: Issues and strategies. *Topics in Language Disorders, 9*(1), 24–43. <https://doi.org/10.1097/00011363-198812000-00004>
- Muller, K., Brady, N. C., Fleming, K. K., & Matthews, K. (2020). Communication assessment for individuals with minimal verbal skills: A survey of current practices and satisfaction. *American Journal of Speech-Language Pathology, 29*(4), 1997–2011. https://doi.org/10.1044/2020_AJSLP-19-00129
- Null, R. L. (2008). *Child characteristics and the acquisition of augmentative alternative communication: Sign language and the picture exchange communication system*. ProQuest Information & Learning. Dissertation Abstracts International Section A: Humanities and Social Sciences, 69(1–118), (2008-99131-177).
- Parsell, C., Eggins, E., & Marston, G. (2017). Human agency and social work research: A systematic search and synthesis of social work literature. *The British Journal of Social Work, 47*(1), 238–255. <https://doi.org/10.1093/bjsw/bcv145>
- Paul, R., & Wilson, K. P. (2009). Assessing speech, language, and communication in autism spectrum disorders. In S. Goldstein, J. A. Naglieri, & S. Ozonoff (Eds.), *Assessment of autism spectrum disorder* (pp. 171–208). Guilford.

- Quach, W., Lund, S., McKelvey, M., & Weissling, K. (2018, November). *Augmentative & alternative communication clinical assessment project: Protocol for assessment of children with cerebral palsy*. Seminar at the ASHA annual convention, Boston, MA, United States.
- Sailor, W., & Mix, B. (1975). *The Topeka association for retarded citizens assessment system*. Pro-Ed.
- Schlosser, M. (2019). *Agency as intentional action*. In Stanford encyclopedia of philosophy. <https://plato.stanford.edu/entries/agency/#AgeIntAct>
- Schopler, E., Van Bourgondien, M. E., Wellman, G. J., & Love, S. R. (2010). *Childhood Autism Rating Scale–Second Edition (CARS-2)*. Western Psychological Services.
- Sigafoos, J., Sutherland, D., van der Meer, L. A. J., Kagohara, D. M., & Achmadi, D. A. (2012). Communication intervention for children with autism. *Journal of Clinical Practice in Speech-Language Pathology*, 14(2), 95–96.
- Sigafoos, J., & York, J. (1991). Using ecological inventories to promote functional communication. In J. Reichle, J. York, & J. Sigafoos (Eds.), *Implementing augmentative and alternative communication: Strategies for learners with severe disabilities* (pp. 61–70). Brookes.
- Soorya, L. V. (2004). *Evaluation of motor proficiency and apraxia in autism: Effects on sign language acquisition* (Publication No. 2004-99004-227) Doctoral dissertation, Binghamton University. ProQuest Information & Learning Dissertation Abstracts International.
- Sparrow, S. S., Cicchetti, D. V., & Balla, D. (2005). *A, Vineland Adaptive Behavior Scales–Second Edition (Vineland-II)*. Pearson. <https://doi.org/10.1037/t15164-000>
- Weissling, K., McKelvey, M., Lund, S., & Quach, W. (2017, November). *AAC assessment protocol for aphasia: Presentation of the validated product*. 1-hour seminar presented at the American Speech-Language-Hearing Association Convention, Los Angeles, CA, United States.
- Wetherby, A. M., & Prizant, B. M. (2002). *Communication and Symbolic Behavior Scales Developmental Profile (CSBS DP), First Normed Edition*. Brookes. <https://doi.org/10.1037/t11529-000>
- Wilkinson, K. M., & Rosenquist, C. (2006). Demonstration of a method for assessing semantic organization and category membership in individuals with autism spectrum disorders and receptive vocabulary limitations. *Augmentative and Alternative Communication*, 22(4), 242–257. <https://doi.org/10.1080/07434610600650375>