

AUGMENTATIVE-ALTERNATIVE COMMUNICATION: ASSESSMENTS

What Are We Looking For and How Do We Find It?

2 CE Hours / .2 CEUs

Course Abstract

This Intermediate level course walks learners through the complex processes involved in Augmentative-Alternative Communication (AAC) evaluations and assessments, with attention to the importance of background information and the many factors to be considered during the assessment itself.

NOTE: Links provided within the course material are for informational purposes only. No endorsement of processes or products is intended or implied.

**(ASHA CE BLOCK – SPACEHOLDER ONLY – COURSE IS NOT YET REGISTERED)
(Intermediate level, Professional area).**

Learning Objectives

At the end of this course, learners will be able to:

- List what needs to be achieved during the assessment process, and how the ecological approach applies
- Identify background information to be gathered, as well as its sources
- Recognize at least four checklists, surveys and profiles available to help guide the assessment process, and some of the questions to be answered
- Recall the processes surrounding the selection of symbols and visual arrays, including the impact of vision and motor issues and the role of vocabulary organization
- Identify special considerations that apply to school-age children, with attention to active learning strategies
- Recognize how the availability of iOS technology and relevant apps affects assessment, including the features of several options

Timed Topic Outline

I. Augmentative-Alternative Communication (AAC) Assessment: What's the Goal? (5 minutes)

II. Paradigm Shift (5 minutes)

III. Background Information (5 minutes)

IV. During the Assessment (50 minutes)

V. Equipment for Assessments (30 minutes)

VI. Making the Decision (5 minutes)

VII. References, Additional Resources, and Exam (20 minutes)

Delivery Method

Correspondence/internet self-study with interactivity, including a provider-graded final exam. *To earn continuing education credit for this course, you must achieve a passing score of 80% on the final exam.*

Course Author

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Susan has worked in a variety of settings as a SLP, a Director of Education, and a Chairperson of the Speech Pathology Department. Her career has taken her to public and private schools, developmental centers, group homes, and adult day programs. She currently runs her own private practice in San Diego, providing Independent Educational Evaluations in speech-language, AAC, and Assistive Technology, as well as consultation and staff training. She presents at a variety of national conferences and provides workshops in AAC, autism, and literacy.

DISCLOSURES: Financial -- Susan Berkowitz is the owner of, and a developer at, Language Learning Apps LLC; offers materials for purchase at TeachersPayTeachers.com; and received a stipend as the author of this course. Nonfinancial – No relevant nonfinancial relationship exists.

Augmentative-Alternative Communication (AAC) Assessment: What's the Goal?

*"The ultimate goal or outcome is to design a system that matches a child's abilities and communication needs. Components of the system should enable the child not only to communicate, but also develop expressive language performance."
(Bruno, AAC, April 2005)*

Unfortunately, there is a "Catch 22" to the assessment process: "We can only see what the individual is doing with what they have been provided. If we think that this all they can do, we don't provide them anything more. If we don't provide them with anything more, the individual never learns more." (Gayle Porter, 1995, paraphrasing Goossens, 1989)

Note that, according to Federal guidelines (IDEA Part C), the term "evaluation" refers to determination of eligibility – "the procedures used by qualified personnel to determine a child's initial and continuing eligibility..." – while "assessment" refers to determination of specific needs – "the ongoing procedures used by qualified personnel to identify the child's unique strengths and needs and the early intervention services appropriate to meet those needs throughout the period of the child's eligibility... and includes the assessment of the child... and the assessment of the child's family...."
(<http://www.asha.org/Advocacy/federal/idea/IDEA-Part-C-Evaluation-and-Assessment-Definitions/>)

In other words, an evaluation uses a variety of assessment tools and strategies to gather relevant functional, developmental, and academic information about a child – including information provided by the family – to determine not only if the child is a child with a disability, but also to determine the child's educational needs.

The two terms will be used more interchangeably in our discussion.

We know that AAC assessments need to be tailored to each individual, their needs, skills, and partners.

However, AAC evaluation, like many things in life, is influenced by the clinician's experiences – and even the most experienced clinician can find an AAC evaluation to be challenging for some clients. Because there is such a diverse range of individuals who may need AAC, it is often difficult for a clinician to be familiar with and feel comfortable with every individual's needs. In addition, the process lacks of specific, systematic benchmarks to identify the features of a "good assessment" and guide clinicians through the process.

Dietz, et al (2012) studied a group of SLPs with differing levels of experience in AAC evaluation. Not surprisingly, they found that SLPs with more general practice experience approached the assessments in a linear fashion, whereas SLPs with more AAC experience (either in practice or research) used a more holistic approach. The general practitioner SLPs tended to focus more on the underlying disability and

standardized language testing. The more clinical and research-based SLPs with AAC experience tended to look more at the individual's overall communication skills and needs, and were more focused on individualizing the communication experience.

That study also fostered a vision of what needs to be achieved within the assessment process. These elements included:

- *Case history and preparation*: collecting background information and preparing for a customized session
- *Language & communication assessment*: assessing receptive and expressive language and/or general communication skills
- *Symbol assessment*: includes ability to identify and use a variety of symbols, and to navigate in order to find them within the system(s)
- *Device trials*: use of a variety of different devices through multiple opportunities of use in natural activities
- *Access method*: assessing as needed alternative modes of creating messages, for those who cannot use direct selection consistently
- *Multi-modal approach*: the use of a variety of different levels of system components, from no tech through high tech, to find the best combination of solutions for a system that is useable in different contexts
- *AAC instruction*: includes teaching the individual and partners how to operate the system and how to make decisions about which system to use
- *Personalization*: use of individualized communication opportunities that meet the client's interests and needs.

A comprehensive AAC assessment involves compiling, discovering, and then integrating this wide range of information about the individual and his needs, in order to make appropriate AAC system and implementation recommendations.

Evaluating an individual for "fitting" an AAC system is, optimally, a dynamic process. This means that it is on-going, that there is a process of trial and refining. Unfortunately, that is not always possible when the individual is taken out of his normal environment to an evaluation center or office, where he may be seen once or twice.

Even in school districts where, theoretically, there is an interdisciplinary team working with the student who can drive this process, members of that team don't always know enough about AAC to complete an effective evaluation. The student may then be referred out to someone who is not familiar with him.

One reason for this may be the lack of general understanding of Assistive Technology in general or AAC in particular. Individual schools may have no one available with detailed knowledge of AAC: there may be one individual assigned to evaluate AAC needs serving an entire district and therefore spread too thin, or there may be an individual or team assigned to complete such evaluations, but a particular student may have needs beyond the level of expertise or type of equipment available.

Decisions about AAC systems should be based on evidence of what is working for the AAC user. Hill (2006) points out the difficulty with using an “expert” based practice of AAC, which may result in different “experts” recommending different systems, based on their “expertise.” Evidence Based Practice (EBP) is more functional, providing for on-going observation of, and collection of data about, the individual and their AAC system. However, “expert” or center-based assessments continue to be used widely.

Paradigm Shift

The process of AAC evaluations has been changing in recent years: while the type of information we need to gather certainly stays stable, the method for gathering some of it has changed. The field of AAC is moving away from evaluation sessions that are more like testing sessions than communication interactions – moving away from assessing only the basic data of symbol type, size, array, and other skills out of context, and towards using genuine communication contexts to evaluate communication skills.

Beukelman & Mirenda (2005) addressed the need for assessing the individual’s participation patterns and communication needs during typical routines and in natural settings. This Participation Model is based on the functional participation requirements of peers without disabilities and is designed to assess and intervene across all environments. We should choose the materials and activities that interest the individual, provide opportunities for the individual to use multiple communication functions, and provide sufficient symbols to express all of those functions. We should not provide just those symbols that meet the individual’s current communication targets, but also vocabulary symbols that provide for the next levels of skills and for partners to use to model language expansion. By using genuine activities to engage the individual while providing sufficient vocabulary with which to interact, we can get a better picture of what he can do currently and what he has the potential to do with scaffolding.

This model is consistent with the ecological approach, which looks at the individual’s functioning in relationship to the environment and its activities within which he must function or participate. It was originally developed by Brown, et al (1979) and Brown (1984) who proposed looking at the individual in every environment and activity in which the he is involved, examining how the individual participated (if at all) and how that participation could be developed and increased. The focus is on how the individual can be independent, included, and satisfied within his daily activities and environments.

The ecological approach lends itself to communication skills easily, in looking at how the individual is able to participate in his environments in terms of ability to gain control over his environment, regulate social engagement and interactions, and give and receive information. The focus is on assessing and then developing communication skills in the context of natural daily environments. Current activities, as well as those in which the individual is expected to participate in the near future, are the focus.

Background Information

The initial piece of the assessment, before even meeting the individual, is the gathering of as much background information as possible.

There are a variety of forms available that can help determine what information is needed. A Google search for A.T. or AAC Assessment forms will yield several results, or clinicians can create their own, asking family, school, and/or other staff members to provide as much information about the individual's motor, communication, social, vision and hearing skills, interests, and support team as possible. The final item on that list should never be forgotten – the available support team is one of the most important items on the assessment list.

One such form is the Wisconsin Assistive Technology Initiative (WATI) Student Information Guide (available on-line:
<http://www.wati.org/?pageLoad=content/supports/free/index.php>).

An often-used system for the navigating the process is the SETT framework, designed by Joy Zabala and found within the WATI. SETT stands for Student Environment Tasks Tools. It asks team members/assessors to determine information about the:

- Student - what are the functional areas of concern, the current abilities in this area, and what is needed for communication that he is unable to or is difficult to do?
- Environment - what are the physical and instructional arrangements, what additional support is offered, what materials or equipment are used, what are the access issues and what are partner attitudes?
- Tasks - what are the specific tasks required for the student to actively participate in the environment?
- Tools – what are the devices, services and strategies that are needed for the student to succeed? Describe what is needed, brainstorm tools that could be included, select the most promising for trial in natural environments, and plan for how the trial will be implemented. Determine what, from the range of no tech to high tech, can assist the student to be successful.

These tools can range from real objects and tangible symbols to no/low tech symbol boards and books to simple voice output devices, speech output devices with more than 1 level to high tech speech generating devices.

(The SETT framework is applicable to adults as well as students.)

Specific information that should be gathered includes:

Diagnosis:

What are the specific symptoms of the presenting diagnosis that can have an impact on the individual's communication, motor, and learning skills? Are there co-morbid factors that need to be considered or addressed?

Status of vision and hearing:

Has the individual passed hearing and vision screenings? Does he wear glasses or hearing aids? Does he have a cortical vision impairment?

There is a differentiation between ocular disorders (where the pathology of the eyes is directly impacted) and neurological disorders (where there is impaired or reduced vision due to an impairment or injury to the brain).

Cortical Vision Impairment (CVI) is a neurological visual disorder that results in unique visual responses to objects and people in the environment. An eye exam yields normal results, but there is a history of neurological issues and the presence of defining characteristics of CVI (below). CVI may be seen in individuals who have suffered asphyxia, traumatic brain injury, infection of the brain or brain maldevelopment.

CVI is the most common cause of vision impairment in children in the USA. It is seen in children who are preemies, who have a neurological disorder, or have had acquired brain injury. Given that 40-80% of the brain is required to process vision, brain damage in almost any area can lead to CVI. The brain loses its ability to integrate and organize visual input received from the eyes.

CVI is not related to visual acuity; it occurs due to brain damage. The student's medical history will include neurological problems rather than problems with the ocular system. The student may be non-responsive visually and responsiveness will be inconsistent, but this is not due to a problem with the eyes.

Students with CVI show distinct color preferences, attraction to movement, visual field preferences, visual latency, difficulty with visual complexity, light gazing, absence of reflexes, absence of visually guided reach, difficulty with distance viewing, difficulty with visual novelty, and difficulty with visual contrast which impacts ability to read facial expressions.

Status of motor skills (both fine and gross motor):

What is the status of the individual's ambulation/gait and his hand-eye coordination? Will he be able to carry his AAC system? Can he point accurately, cross midline? Can he write or type? Where and how does he sit: is he in a wheelchair, an adapted chair, or a regular student chair?

Status of communication skills:

Create a list of communication functions down the side of a page, and a list of communicative behaviors across the top. Include gesturing and pointing, vocalizing, verbalizing, signing, using proximity, eye gaze, reaching, guiding/taking, other

behavioral responses. Ask caregivers and other frequent partners to fill it out. Also ask about prior experience with AAC systems.

Your assessment will need to determine whether the individual is functioning at a non-intentional stage of communication, an intentional but non symbolic level of communication (understanding of cause-effect is present), a nonlinguistic symbolic level of communication (specific behaviors have acquired specific communication meaning) or at a linguistic level of communication. This will influence not whether you provide an AAC system, but where in the process of intervention you begin.

Status of language skills:

What does the individual understand? Does he localize to his name, follow single step directions, follow complex directions, demonstrate comprehension of the names of object, people, places, verbs, concepts of color, quantity, quality, spatial relations, sentences, yes/no questions, Wh-questions, etc.?

Status of literacy skills:

Can this individual read and/or write/type? At what level?

Environments:

Is the individual at home, at school, in a Day Program, at a work site? With whom does he need to communicate? How dedicated are these communication partners to providing adequate AAC intervention and support? Are there environmental factors that may stand in the way of the individual acquiring AAC skills?

Preferences:

Ask about what the individual likes and likes to do. This is not only important for considering where and how the individual will need to use his AAC system, but also to give the assessment team some ideas of how to individualize the assessment session using activities or topics the individual enjoys.

Partners:

Where does the individual need to communicate and with whom? Is he only in contact with immediate family members/care givers or does he spend significant amounts of time in the community with people who aren't familiar with his communication responses? Is he usually communicating one on one, or does he spend time in large groups, such as in a classroom or group work area?

If the assessment is with a school-aged individual, a copy of the IEP (at least the Current Performance Levels portion) should be provided to the assessors. This can be a valuable source of background information and current status. Also, copies of the most recent speech-language, psychological, educational and/or assistive technology evaluation reports and medical reports should be provided if possible. The parents or caregivers should be asked for information about the environment and how the individual reacts to it and communicates within it. This may differ from what the school provides significantly.

In short, the gathering of as much background information as possible is important. This will assist in planning the evaluation session and activities, making decisions, and in writing the final report.

During the Assessment

Some of the questions that need to be answered include:

- Can the individual answer yes/no and/or Wh-questions consistently?
- Can he recognize and understand symbols to be used in an AAC system?
- Can he use single message buttons, a sequence of symbol buttons, a combination of symbol buttons and/or typing or text-to-speech generation alone?
- Can the individual find a symbol button only on the visible page, or can he navigate between pages to find the word or message needed?
- Can he combine symbols to generate language?
- Does he initiate or only respond?
- Does he use only noun referents or can he use more general/core vocabulary?
- What are his language abilities in the areas of form, content, and use?
- Which communication intents does he use, which are emerging, which are stimuable?
- Does the individual have the physical capacity to use an AAC system to achieve functional communication?
- Which alternate modes of access can he use or learn to use?
- If the individual has a visual impairment, can he process visual input, discriminate symbols, and/or need considerations for contrast, light, movement?
- How does he communicate during familiar and/or motivating activities?
- How does he communicate with different partners?

While there are no standardized assessments for AAC, there are some checklists, surveys and profiles that can be helpful to fill out to guide the process.

The Test of Aided-Communication Symbol Performance (TASP), published by Mayer-Johnson and developed by Joan Bruno, provides a series of testing tasks that look at symbol type and size and array. It can be used only with individuals who can directly point to pictures or words, and takes about 10-20 minutes to administer. It provides information on categorization, grammar encoding, and syntax performance, as well as some information on communication display design, page set use, strategies, and goals.

Subtests include symbol size and number (how many symbols, what size, does the individual show memory for location), grammatical encoding (recognizes categorical associations, recognizes symbols in a variety of classes), categorization performance (assesses different categorization styles and directs

vocabulary organization), and syntactic performance (ability to form various structures of phrases).

The TASP is meant to complement other aspects of the assessment process, and provide a starting point for designing a communication display and/or selecting an appropriate page set on a high tech device. (<http://www.mayer-johnson.com/tasp>)

The Augmentative and Alternative Communication Profile, published by LinguiSystems and designed by Tracy Kovack, provides a checklist for evaluation of operational, linguistic, social, and strategic areas of AAC use and learning. It provides for test-retest data on the same form and uses a numerical rating system for a variety of sub skills in the four major areas of AAC competence (linguistic, operational, social, and strategic). (<https://www.linguisystems.com/products/product/display?itemid=10547>)

The Functional Communication Profile - Revised is published by Pro-Ed/LinguiSystems. It is also an inventory, and provides for gathering information about the individual's sensory-motor, attentiveness, receptive and expressive language skills, pragmatic/social language skills, speech and voice, oral-motor, fluency, and non-oral skills. Each test item is well-defined and the format translates easily into an assessment report format. (<https://www.linguisystems.com/products/product/display?itemid=10218>)

The Communication Supports Inventory - Children and Youth by Charity Rowland and Melanie Fried-Oken is available for free online. It is not meant to be an assessment inventory, but rather to be used for decision-making in intervention and goal setting. It is, however, often used in assessment as a checklist of limitations a student faces in the academic setting as a result of communication deficits, including restricted participation, limitations on comprehension and literacy, expressive language and literacy, restricted functions of communication, and restricted social engagement. It also lists AAC strategies, motor access, body limitations that impact communication, and restrictions placed by the physical environment. (<http://icfcy.org/aac>)

The Communication Matrix, also by Charity Rowland, is another online resource that is an excellent evaluation tool. It pinpoints exactly where and how a child is communicating, and provides a structural framework for moving forward. The form is also available from www.designtolearn.com.

The online tool moves you through each stage and skill, page by page, and then generates a clear visual profile of the individual's current communication skills. Because of the visual nature of the framework, understanding where to set goals is clear.

The matrix is designed for individuals whose skills are at the 0-24 month level, and accommodates any and all forms of communication, regardless of the complexity of the communication disorder. It addresses the 4 basic reasons to communicate: to obtain what we want, refuse what we don't want, engage in social interaction, and provide or request information. Within each of those areas is a series of questions about why and how the individual communicates. The matrix addresses communication behaviors from pre-intentional, intentional, unconventional and conventional communication, through symbolic communication and early language development.
(<https://www.communicationmatrix.org/>)

(fig. 1)

One informational assistive technology form for clinicians using iOS devices is the ATEval2Go app, by Smarty Ears. This app creates a virtual form into which the clinician can fill information for assessment and settings.

There is space to add student and teacher information and background information on the student, such as reason for referral, current accommodations, targeted goals. There is space to input notes on the environment, present technology, performance of the student in the activity. There is a page for suggested recommendations in the areas of reading, communication, vision, composition, math, organization and studying, computer access, recreation, daily living, hearing and other. The app will generate a report.
(<http://smartyearsapps.com/service/ateval2go/>)

Beyond filling out one or more of the above profiles, an environment needs to be created in which the clinician(s) can interact with and engage the individual in order to gain sufficient information about what he does and how he does it, what he will and can do with an AAC system, and what is stimuable within the assessment session. An assessor needs to identify the contexts that are interactive, motivating, meaningful, and high frequency, and provide sufficient vocabulary to engage the individual.

It has been determined that genuine assessments need to include using meaningful activities, motivating activities, and genuine communication contexts in order to provide more genuine information about the individual's communication skills.

The clinician(s) should sit with the individual and offer a variety of topics or activities, as well as have available a variety of communication displays. Opportunities should be provided for the individual to choose the topic or activity. The displays provided should have adequate vocabulary available for the individual to comment, request, continue or discontinue, ask for something different, talk about what he's doing; the clinician should provide adequate aided input that models how to do this. Displays should offer a variety of visual and linguistic complexity.

Then, the clinician does all the things that would be done with a verbal client/student. If he's using a single word response, the clinician tries to model two-symbol sequences. "More" might be made contingent upon using "more + ___" sequences. Interrupting the activity to provide opportunities for this - without doing it so often that the individual becomes frustrated - is a useful strategy.

The clinician can see what happens when trying to vary the activity or do something different. How does the individual respond if the topic is changed? Clinicians should keep modeling appropriate language structures throughout and see if they can "push the envelope" of the individual's response patterns.

Symbols and Visual Arrays

In order to make good decisions about the AAC system, we need to make decisions about the types of symbols, their size and color, and the size of the visual array the user can discriminate and physically access.

The size of symbols themselves is often determined by the fine motor and vision skills of the individual. Young children tend to do better with larger symbols, such as 3" or 4" squares; this size is also sometimes needed if an individual requires a large target to "hit." 2" is a fairly standard size used often in visual displays and communication books because it's usually easy to see, and has the advantage of being large enough to be handled individually or pointed to on a board of several symbols. Individuals without vision or fine motor impairments can often use smaller symbols, 1" sq. or smaller, to allow for significantly more vocabulary per page/display.

If it is known or suspected that an individual has cortical vision issues (which are often found in individuals with cerebral palsy and, increasingly, in individuals with autism), displays will need to be prepared that address these specific needs. This can include making assessment pages with larger symbols and utilizing color contrast, including use of specific colors or the high contrast symbols offered by Mayer-Johnson's PCS.

There is a good deal of debate about symbol type and array size.

Typically, we assess for the student's abilities to use photographs, line drawing symbols in black and white or color, specific symbol set preference (e.g. PCS, Symbol Stix, Smarty Symbols, Widgit Symbols, Bliss Symbols). Some researchers posit that the type of symbols used should directly correlate with the user's developmental level. Others have shown that whatever symbol system is used is irrelevant in the presence of good teaching (through Aided Language Stimulation and modeling and maximized opportunities). Largely, it is accepted that an individual can learn to use a symbol system that is adequately and consistently taught.

(Aided Language Stimulation (ALgS) is a process in which communication partners provide an individual with immersion in aided communication by using the aided system when speaking to him. It is one of the most important steps in teaching an individual to use picture-based communication: use of the AAC system to communicate with the

individual all the time, using the pictures to interact for real communication purposes throughout the day, provides the kind of language modeling that verbal children receive.)

The “need” for an individual to move through a hierarchy of symbols as he learns to use AAC is now usually considered a myth, and a process that makes learning to use an AAC system more difficult. There are always exceptions to this, most notably individuals with vision impairments, and older individuals with developmental disabilities who have not had prior AAC intervention. Some individuals with severe disabilities can only use symbols when supported by a knowledgeable partner; however, using symbols – even with a partner – is more autonomous than communicating independently with only a very limited vocabulary.

Recognizable symbols are those that are concrete enough that their meaning is clear to members of the same cultural community. These symbols, called “transparent,” use critical elements of the item featured to enhance recognizability, and include words that do not have multiple meanings competing for interpretation.

Symbols that have less transparency are those whose meaning may not be immediately recognized, but which make sense once explained. The relationship between the symbol and its meaning needs to be directly taught. Because many symbols represent only a part of an item or action, their meaning only becomes clear when it is learned.

Of more difficulty are symbols for words that have multiple meanings. Selecting a symbol to represent these words means reliance on context - a linguistic skill - for interpretation. Symbols and words cannot have a 1:1 correlation. Lonke (2014) points out the difficulty in sequencing symbols to construct sentences when the meaning of the symbol used does not necessarily correlate with the word meaning in the given context.

Angermeier, Schlosser, Luiselli, Harrington, and Carter, 2008, looked at the effect that picture iconicity in PECS symbols has on requesting, and found that "Based on the results of this study, less iconic symbols may be acquired at the same rate as more iconic symbols at least during Phases I and II of PECS training." (p.443)

Romski and Sevcik, 2005, concluded that "...during early phases of development, it may not matter if the child uses abstract or iconic symbols because to the child they all function the same. The choice of symbol set may be complicated by what families perceive as appropriate for young children." (p.181)

When individuals move from selecting between a few symbols to a larger display, color codes help them find the symbol they want more quickly. Color codes are particularly helpful when the user starts combining symbols into phrases.

The Modified Fitzgerald Key is one color coding system:

- Blue: Adjectives
- Green: Verbs

- Yellow: Pronouns
- Orange: Nouns
- White: Conjunctions
- Pink: Prepositions, social words
- Purple: Questions
- Brown: Adverbs
- Red: Important function words, negation, emergency words
- Grey: Determiners

Another is proposed by Goossens, et al:

- Verbs - Pink
- Descriptors - Blue
- Prepositions - Green
- Nouns - Yellow
- Miscellaneous (WH-words, Interjections, Negative Words, Pronouns) - Orange

One of the biggest advantages of color cues – especially during ALgS and modeling – is that they remind the communication partners talking with the AAC user to pay attention to the kinds of choices they are offering. Are partners teaching and talking only about *things*, or are they giving the AAC user chances to request *activities*, to *comment*, to *ask questions*? Are they modeling and offering language rich with *descriptors*? When the symbols are color-coded, a quick visual scan of the display will answer those questions and let partners know when they need to adjust their language.

In terms of symbol array size, it must be remembered that anything new requires learning and that the end goal is not the initial objective. There is often significant discussion about the number of symbols to be used on an individual's AAC display page when professionals assume that where they start is where they are going to end. It is much more useful – and more common now – to consider the ending point, to use a display size that embraces the individual's potential for use, and then to restrict the population of all of the buttons to only those that the individual can or is expected to use in the short term. Most high tech AAC devices have the capacity to hide buttons, so that, for example, a 40 button page appears to only have 15 buttons filled. As the individual acquires – or is being taught – more vocabulary, additional buttons are made visible.

Thinking carefully about the symbols to be used on a display requires also thinking about those that are not needed. Individuals who are able to use gestures for *yes* and *no* do not need to have these buttons on their AAC system. An individual with a vision impairment that limits the number of symbols in an array, but who can wave, might not want to give up valuable button space for *hello* or *goodbye*.

There is also debate about size of array v. complexity of navigation needed. We often confuse an individual's need for simplicity with a need to limit access. And we forget that a display with more symbols is easier to access than 3 separate pages holding

those symbols in smaller arrays, but which require navigation from page to page to reach.

Impact of Vision and Motor Issues in Symbol Arrays

Accessibility is one factor that plays a significant role in the size of symbols and visual array. The individual's ability to see and discriminate symbols that are small, or visual displays that are complex, needs to be assessed and considered. Ability to activate buttons in all areas of the screen or hit a target that is smaller than one's finger, or hit only a target button without accidentally activating another button with a knuckle or heel of the hand, is also a significant issue. Regardless of the advantages of limiting navigation, for some AAC users this is not an option.

If the AAC user cannot activate a button or point to a single target picture with an isolated finger point, we need to determine what he can do. Some users are very adept at using a different finger or part of the hand for activation. Some users with cerebral palsy or hand contractures due to brain injury are able to isolate a button effectively with a thumb or other finger, with the corner edge of the heel of their hand or with a knuckle. Others use a stylus, a head pointer or mouth stick pointer.

Alternate access modes include the head mouse, head tracker, joystick, and mouse emulators, which are all modifications on direct selection using infrared beams or computer access modes. Key guards can be used to assist with direct access, but also used to count spaces as a tactile guide to the display. This requires memorizing the displays and sequences.

Given a dynamic display high tech system, individuals who cannot use direct finger selection may utilize the device's scanning patterns to select the desired button with an adapted mouse, a joystick, trackball, head mouse, or switches. Switch/Scanning is the slowest way to access an AAC system: a device sequentially presents choices or groups of choices to the individual.

Communication Skills, Communication Needs

Throughout the assessment clinicians need to look at the difference between skills and needs:

1. What does or might the individual need to communicate that he cannot?
2. Who does he want to communicate with that he cannot?
3. What type of situations might he need to communicate in that he cannot?
4. What vocabulary does the individual currently have available to him?
 - a. What vocabulary do the various systems being considered have to offer?
 - b. Is it sufficient for successful participation?
 - c. Is it sufficient to meet all needs; including functional off-topic and social comments?
 - d. Is it available permanently?
 - e. Does it allow for genuine communication in the environment; especially school and work environments?

How should that vocabulary be organized? Will a core word system that limits navigation and focuses on use of a smaller number of reusable words work for him, or can he use a system with a larger vocabulary of core and fringe words, but will rely upon a partner to assist him with autonomous communication? How will the organization of vocabulary impact his autonomy? Will he be independent?

(Autonomy and independence are not the same thing. An individual can be autonomous (in charge of creating his communication messages where and to whom he wants, with few restrictions on what he can say) without being independent (able to say something without assistance). For example, the individual may be able to use a BigMack button independently, but it will certainly not allow him to say whatever he wants in a variety of communication contexts. To truly be independent, the individual needs to be able to **determine for himself** what his messages will be, no matter what he wants to say, where or when or to whom he wants to say it.)

In order to make these determinations it is important to be familiar with the different systems of vocabulary representation in AAC systems, as well as the various ways in which vocabulary is organized.

Available methods of AAC representation and organization include single-meaning pictures (where each word is represented by a different symbol), alphabet/word/keyboard based systems (which require the user be sufficiently literate to spell or recognize words), and the semantic compaction linguistic system of Minspeak symbols used in Unity-based systems (made by the Prentke Romich Company).

Two of the most prominent language-based organizational systems in use today using single-meaning pictures for symbol-based communication are *core vocabulary* and *pragmatic intent vocabulary*. Categorical and activity-based systems, where vocabulary is organized into pages by category or topic, are still widely in use, but are being more and more transformed into core based or intent based systems.

Language-based systems organize vocabulary based on how the words are used to construct linguistic messages: there might be a main page of either words/phrases that can be used to start a message and some core vocabulary words. Language-based systems provide the AAC user the opportunity to say something new or self-selected, and allow the user the flexibility to communicate his own unique thoughts.

Core vocabulary is a small set of those high frequency words which we use the most often and across contexts (Cross, Baker, Klotz & Badman, 1997); about 80% of what we say is comprised of core words. Core vocabulary boards and books focus on providing students with those words that research has shown to be the most-used to generate language responses. These words are usually useable in a variety of contexts on a variety of topics, and can be combined

together in a large number of ways to create novel messages. Core vocabulary contains all parts of speech – nouns, pronouns, verbs, adjectives, adverbs, prepositions, conjunctions, and interjections – although there are very few nouns in general, and none in early core word lists. Core word teaching serves as a great method for teaching language, particularly generative language teaching.

Communication systems organized by pragmatic intent provide a wider vocabulary set, with the main page being a branching-off point for finding words based on the purpose of the message. Pragmatic organization focuses on providing maximum vocabulary for a robust system that begins by considering and signaling the intent or function of the message. Pragmatic organized systems aim to provide for communicating all of the time, in all environments, on a variety of topics and for a variety of messages.

Specific Considerations for School-Aged Students

There are differences beyond age and developmental level when considering AAC for school-aged children. Access to the curriculum is a significant piece of the assessment and intervention puzzle. School is where the individual spends a large portion of the week, and is where he will be prepared for life beyond school. In addition to the team members who know about language and motor skills and needs (the SLP, OT, and PT), someone who is knowledgeable about the curriculum needs to be a part of the decision-making team.

During assessment it is important to look at and consider the student's ability to use language for a variety of functions, to look at each system's ability to provide sufficient vocabulary for curriculum access, and to observe how the student finds and uses vocabulary needed for different types of interactions.

The communication requirements in a school are significantly different from other environments: there is often less social language needed and more emphasis on responding, and curriculum demands often place the emphasis on different language than other contexts. Another difference is the demands of the communication partner – teachers ask for very different kinds of responses than social partners and caregivers. Often answering questions in class requires understanding and using decontextualized language. Working in classroom groups requires mediation and self-advocacy skills, in addition to the specific language skills of the lesson. Unfortunately we rarely provide sufficient intervention in narrative skills, conversation skills, and literacy skills (one exception is the structure of conversational narratives, which form the basis of story narratives, which are used substantially in school).

Communication demands in the classroom vary, depending upon whether all learning is teacher-directed and whether there is ample opportunity for the student to interact with others and participate in class activities. It is important to know whether the teacher offers choices, knows to wait for student responses, asks open-ended questions. If the child has some AAC access, is there sufficient vocabulary on it for successful participation? If not, what is missing? Is there sufficient vocabulary to meet all

communication needs, including off-topic and social comments? Is it available permanently? Is the student engaged? Most importantly, it is important to know whether the student is a passive member of the class, or an active participant.

Active learning strategies can apply to all levels of objectives on Bloom's taxonomy, from knowledge and translation to evaluation and synthesis. Active learning is particularly important for application, which is necessary in order for learning to become a part of long-term memory and be retrievable. Jarolimek and Foster (1981) describe the "activity mode" of teaching as a set of strategies that involves students in learning by doing things that are meaningful and related to the topic of study. These types of strategies are particularly important for students whose disability(ies) have restricted their life experiences and background knowledge.

Working with children has its own set of challenges, but activities can be easier to find for engagement. Use the information you collected on the background forms to plan for a variety of activities the individual might like.

Always have a good supply of bubbles! The children's versions of many AAC device page sets come with an activity page for bubble play, which speaks to the universality of bubbles. I have even successfully used bubbles to engage with a child in a foreign language I didn't understand or use, but which was available on the system. As with many play activities with kids, one can request (bubbles, want bubbles, more bubbles, I want bubbles), as well as comment and direct (I blow, you blow, blow more, big, small, lots, all gone, pop, catch), which can be a lot of language for a child who has not previously had an effective AAC system.

Other suggestions include play doh, coloring materials, toy cars and trucks, movies, a small ball, koosh and other sensory items, a deck of cards, puzzles, blocks or legos, makeup... the list is almost endless. A portable DVD player and an assortment of DVDs (from Barney to the Super Bowl) can also be invaluable, as is an MP3 player with a range of music.

Then let him choose. Make sure your AAC displays have those available activities on them in addition to core word displays. Think about where they are in the vocabulary organization of each, and how many pages need to be navigated through to find them. Have a variety of organization options; also, have a variety of options of array size and button or picture size.

Assessment Snapshot:

L.D. was a 17 year old girl with cerebral palsy.

She had had very limited experience with AAC because she could not access the paper-based displays used in class. Her teacher and SLP held up two choices of items or pictures for her to choose, but had not tried larger arrays or other access modes.

L.D. came into the initial background session with her hair done nicely, wearing jewelry and a little lipstick. She was reported to be a “typical teenager,” with preferences for clothing and accessories. She enjoyed talking about teen heartthrobs and musicians.

When she came back for the assessment, I had a variety of songs on my iPad and a tray of nail polish and eye shadow, in addition to my usual bag of “stuff.” Her eyes went straight to the nail polish. During the assessment we tried a variety of scanning patterns and switches for access, as well as eye gaze technology. We looked at switch placement, array size, and type of symbol used. We checked for color preference for buttons and backgrounds, as well as placement because her vision was unknown.

She and I “chatted” while I did her nails. I modeled making comments about the colors, the job I was doing, and the music she chose for us to listen to. By the time I was done with her nails (I am notoriously slow at these things in evaluations), we had helped her gain some understanding of how the scanning worked and when to hit the switch. When I helped her get to a “chat” page, she was able to make comments – something she had never been able to do before, but something she was clearly able to do given the tools.

The point of this snapshot is a big one – never underestimate the individual. This young lady clearly had things she wanted to say, and the language skills to say them when provided with an AAC system with the vocabulary to do so.

Pushing the Envelope

Within the assessment the clinician should push the zone of proximal development (ZPD). The zone of proximal development, a concept introduced by Lev Vygotsky in the 1930s, is the difference between what an individual can do without help and what he can do with support. Vygotsky believed that when learning was properly organized cognitive development ensued. Applying learning strategies to an individual set in motion development that occurs only when the child is interacting with others in the environment. He believed that individuals play an important active role in learning.

(fig. 2)

So, during the brief time you have in doing an assessment, your job is to begin to define the limits of that zone. If an individual used one word, can you get him to use two? If he only used the page displayed, can he navigate to that page from one other? How about two? If he used one core word, can you get him to add another?

Model, Pause, Prompt, Pause Again.

Assessment Snapshot:

R.J. was a 5 year old boy with autism.

He had experience with only a limited array of symbols velcro'd to a board from which he could choose reinforcers during break times in class and at snack time.

He was very interested in Thomas the Train and loved watching Thomas movies. There wasn't much else that engaged him.

He had difficulty navigating from a "home" page by choosing "want" or "watch" to get to a choice of activities. From the choice of activities, he was able to choose the "DVD." He was then on the page of DVD choices where he easily found "Thomas." I went back to the home page and modeled "go," then turned it on.

Once the movie was on, I tried lowering the volume, and modeling "turn it up," but R.J. wasn't as interested in listening to it as he was in seeing it. After a minute he just reached over to the DVD player and turned it up himself.

We watched for several minutes, then I hit the pause button. I began by modeling "Thomas." When he followed the model I turned it back on. The next time, I backed out of the DVD choices page and went back to the home page, where there were some core word options. I tried modeling both "go" and "more" after hitting pause. He was more receptive to "more," since he had prior experience with people prompting him to ask for "more."

Throughout the session, I tried to "push the envelope." I modeled "more + Thomas," "more + watch," "more + DVD," "want + watch," "want + more," and "want + Thomas." He was most stimulable for two-button sequences that didn't require navigating, so "more" and "want + more" were the easiest for him to follow and attempt. "Want + watch" also got some responses near the end of the session, as watch was on the home page of one of the displays. I also modeled "like" and "funny" at times and, when it looked like he was getting restless, I modeled "different" and "all done," to see if he wanted to watch a different DVD or just wanted out of there. When I hit "all done" he immediately got up and went over to his mother. He understood, but did not yet express that message.

There are a couple of points in this snapshot. First, I chose an activity I knew would interest R.J. and hold his attention: watching a movie together may not always be the most interactive activity, but it is a place to start. Second, I noted his ability to use single word responses, to use words with which he was more familiar and had been prompted to use before, and to be stimulable for use of basic two core word sequences.

Communication Functions

Communication functions are an important part of an AAC assessment – or any language assessment for an individual with significant language needs. There are many communication functions; however, often the AAC user gets stuck at a requesting stage and is not helped to progress. Particularly consider what communication the individual uses beyond requesting:

greet
part

hi, hello, what's up, yo, hey
bye, see you later, good-bye

affirm	yes, ok, I agree, that's right
reject	stop, all done, no more, finished, no, not
negation	no, not, stop, not that
cassation	stop, o more
request assistance	help, I need help, I need you
request recurrence	again, more, do again
request information	what, why, when, where, who
request object	that, this, the, it
request action	want, get, give, do, turn, put, open, close
direct	go, get, help, come, up, try, there
redirect	different, another
existence	that, there, look, it
nonexistence	none, not
disappearance	all gone, away
possession	mine, your, his, hers
commenting	like, don't like, bad, good, silly, mean
describing	fat, tall, cold, hot, fast, under, between
person	I, you, him, mom, dad, grandma
interjection	Cool!, No way!, Wow! How about that? Darn!
questioning	who?, what?, where?, when?, why?, how much?, how?

Often students and adults with developmental disabilities come to AAC assessments having been given only the tools to make choices or requests. Requests can be made for objects (the most frequent), for activities, attention, assistance, recurrence, and information. Other functions include asking, responding, directing others' actions, commenting, protesting, greeting. Do a communication mode survey (some of which should have been provided as a part of the background information) to assess if the individual is using a given function at an intentional v. unintentional level, at a symbolic v. non symbolic level, gestural level, or linguistic level with sequenced symbols or words. Throughout the assessment, use that information to see whether you can push any of their independent skills into the next level.

Sometimes you will find an individual who has no play skills, nothing in particular he likes to do, nothing you - or his team members - can find to motivate him. At these times, the most motivating messages can be "Leave me alone," "I need a break," "do different," "stop." Model those, then honor them. No matter how "uncommunicative" the individual appears to be, he has some behaviors he uses to communicate. Find those, find the message behind them, and develop a plan to replace them with the appropriate communication mode.

Assessment Snapshot:

I once spent about 40 minutes wandering around the house with Sam, a young man (about 30) with autism.

He had had high tech AAC systems in the past, but was no longer using them, in part due to increasing loss of vision. I followed him from room to room as he tried to get

away from me, and my request that he communicate with me more efficiently. After several times telling him that if he wanted me to leave him alone he would have to tell me, he finally reached out to the dynamic display device I was carrying, found the “Leave me alone” message and used it.

I left him alone. At the least, I knew he was capable of using an AAC system when it really mattered to him.

Equipment for Assessments

Not many SLPs are fortunate to have an AAC clinic or lab available in which to do assessments with a wide array of available technology – but at the least, there should be an array of paper-based displays available including PODD communication books (PODD, or Pragmatic Organized Dynamic Display, refers to a style of communication book that emphasizes communication intent, aided input, and structured navigation conventions), core vocabulary books and displays, different types of switches and alternate access technology as needed, and an array of dynamic display technology.

It is this last requirement – the availability of dynamic display device choices – that is difficult for many SLPs.

One solution is to use your local manufacturer’s representatives – that is what they are there for. Ask to borrow devices or have them bring them. In addition, find out if there are loan programs in your area. Several states have state funded programs from which SLPs, families and users can borrow a range of technology; for example, California’s CATE (California Assistive Technology Exchange) has 13 locations throughout the state with a wide variety of equipment available for 30-day loans.

While nothing is going to take the place of device matching trials in AAC, single practitioners and school-based SLPs with limited equipment budgets can make the most of the new iOS technology and the proliferation of AAC, fine motor, and language-based apps when performing AAC evaluations.

The explosion of these apps provides a wealth of data mining opportunities for evaluators. Using them to gather much of the information needed in many AAC assessments means less emphasis on having a complete range of AAC devices on hand – something only some evaluation centers have the “luxury” of providing.

While many of the AAC apps available are simple choice boards and offer minimal ability to expand and really teach or use language, there are others that have lots of potential as assessment tools, even if not sufficiently robust as a primary AAC tool. Judiciously budgeting for a small number of these can provide a wide range of assessment tools for private practitioners and schools.

iOS devices and apps can also assess the variety of skills to be considered beyond basic language skills and communication behaviors. Access did not remain an unaddressed issue for long in iOS: developers quickly filled the void with scanning apps and bluetooth switch capabilities.

Once again: we want to define the individual's skills and abilities in language (both current and extended possible); physical abilities in vision, hearing, physical access modality; response to environmental demands, barriers, and partner skills.

What is the individual doing now; what more could they do given changes in partner training, changes in the encoding system, changes in the access mode, etc.?

What features does an AAC system for this individual need to have – voice type, screen size, array size, encoding method and then icon type or literacy limits?

All of the answers need to come from the process of evaluating this individual with the best tools we can obtain.

(While we discuss the following apps, please remember that we are looking at them as assessment tools, and not recommending them as complete AAC systems. Also note that the information on apps changes almost daily. New apps are constantly being developed and current apps are constantly updating and upgrading: Assistiveware in particular puts out frequent updates with new features. For switch access, also note that not all apps work with all bluetooth switches – refer to the developer for that information.)

The *AAC Evaluation Genie* is an app for the iPad designed by a speech-language pathologist to provide information on specific AAC related tasks in a structured sequence of activities. The app uses standard “touch the picture(s)” format to assess comprehension from the word to phrase level and ability to recognize and use symbols. (Bear in mind that it is a decontextualized task.) Data is taken and provided by the app. (<http://www.humpsoftware.com/aacevaluationgenie.html>)

The tasks in the *AAC Evaluation Genie* include:

- Visual identification - looks at ability to visually track a single icon from 5” to 1” in size, in different array sizes
- Visual discrimination - looks at ability to discriminate a single icon in varying sizes and array sizes
- Noun vocabulary - looks at the user's ability to identify common nouns by name
- Function vocabulary - looks at ability to identify items by function
- Verb vocabulary - looks at ability to identify common named verbs
- Category recognition - looks at ability to identify categories that include items
- Word association - looks at ability to identify items by function or association
- Category inclusion - looks at ability to identify nouns by their category
- Category exclusion - looks at ability to recognize items that do not belong in categories

- Pixon core vocabulary - looks at ability to recognize named symbols from the Pixon symbol set (a hybrid set combining elements from the PCS icons from Mayer-Johnson and the Minspeak/Unity icons from Prentke Romich).
- Unity core vocabulary - looks at ability to identify named symbols in the Unity symbols system
- Unity icon patterns - looks at ability to recognize Unity semantic compaction patterns
- Picture descriptions - looks at ability to describe pictures using an AAC display to sequence words/symbols
- Word prediction - looks at ability to read text and select a target word from a list of four choices

One way to use iPads and less expensive AAC apps in assessment is to select an app that has sufficient pages options – for display size, for color customization, for navigation, and for voice output – and set up a variety of pages to use. Create pages that offer appropriate vocabulary for a variety of topics and activities, with a variety of symbol types, array sizes, and color choices, and differing levels of language complexity. Create a master “home” page that links to each of these, so that you can access them quickly and easily during assessments.

GoTalk Now is one such choice. The app does not come with any created pages, except as an in-app purchase. You can create as many successive links as you need from one page to another. You can create pages with 4, 8, 9, 16, or 25 buttons for each activity you choose. You can change the page background, button background, and button border colors to accommodate students with vision issues. You can create core word pages and fringe word pages, as well as PODD pages; create basic core word pages of various sizes; create activity based pages with both core and topic-specific words; create choice boards as needed.

With some individuals you may need to start with just 4 core words. You can “push that envelope” up to 8/9, then 15/16.

GoTalk Now comes with a limited array of realistic images. You can purchase Symbol Stix as an in-app purchase. You can import any image from your iPad camera roll (which includes images you can download from the internet). You can create buttons with multiple images or with just text. You can change the font size of the text.

(fig. 2a, 2b)

GoTalk Now also allows you to create visual scene pages with button hot spots. For example, use a scene of crayons where each crayon is a button that says the color name. Or a family scene where each person’s face says their name or something about them or says “I want to talk to ___.” (Visual scenes are not a good choice for many users; they may be too visually complex. They are useful for students who can use the visual contextual cues and focus on the critical elements.)

You can also add video clips and music to buttons and scenes. This is often successful with kids and adolescents who want to choose specific music or videos, but lack literacy skills or have low vision. (<http://www.attainmentcompany.com/gotalk-now>)

Sounding Board is a free app that has some similar features, but with more limitations. Its pages can have 1, 2, 4, 6, or 9 buttons. There are fewer adjustments to button size and color. Like *Go Talk Now* it is switch accessible. It does not come with many symbols, but, again, it will import images from the device's camera roll. Pages can be linked for navigation and use of categories to find vocabulary, which makes it a bit more powerful than it looks. It can be used easily to create pages for choice making, gaining attention, protesting, requesting items and actions and assistance. Pages can be created for use of a limited range of core vocabulary or expanded core with some navigating. Users have the ability to find items within category files. It could potentially be used to create a very limited PODD-style system with restricted functions. (<https://www.ablenetinc.com/soundingboard-1>)

(fig. 4)

Tap Speak Choice offers pages with 1-24 buttons, with 1-56 messages per page, and with key board options with word prediction. It is switch accessible, and offers auditory scanning without a switch. It is currently a bit more expensive than *GoTalk Now*, but the text-to-speech with word prediction option makes it more powerful for some users. Text-to-speech is available in multiple languages (as is *GoTalk Now*) and recorded/digitized speech is also available in both apps. *Tap Speak Choice* comes with several basic vocabulary pages and a variety of core word pages already programmed.

The icon size in this app is pre-set, with a black background. This limits its usefulness for many users. Images included are PCS and some photos. You can import your own images. The images go into a message window for users who can sequence buttons to construct messages. (<http://tapspeak.com/drupal/Choice>)

(fig.5)

Lingraphica makes some free apps that can be useful in assessment, particularly with users who have had stroke (Lingraphica's target user) or brain injury, or who have developmental delay. Some of the apps, specifically for conversation, daily living requests, and acute hospital needs, have a single image and message per page. (<https://www.aphasia.com/about-lingraphica/about-us/>)

(fig.6)

There are several more robust AAC apps that are typically used as complete AAC devices for many users. These are more robust in their vocabulary access, grammatic morphology and syntax options, and use of text-to-speech with word prediction. They are more expensive, but good to have both for evaluations and when you have users on your client caseload.

Some of these include *Proloquo2Go*, *TouchChat HD*, *Sono Flex*, *CoughDrop* (<https://www.mycoughdrop.com/>), and *LAMP Words for Life* (<https://aacapps.com/lamp/>).

In some cases you can take advantage of the nearly seamless transition from app to device. *TouchChat* (both the iPhone version and HD iPad version) mimics the software on Saltillo's Nova Chat devices, which come in 5", 8", 10", and 12" screen display sizes to accommodate a wide variety of users and their needs for access, portability, normalcy. *LAMP Words for Life* offers Unity's 84 location pages; both full and 1-hit.

The *Sono Flex* app from Tobii can be customized with your own activity pages, which is useful both for end-users and in an assessment. The activity pages are easily accessed during an assessment while still maintaining access to core vocabulary. The ability to create these custom pages means more genuine opportunities in an assessment geared towards the individual's interests. Access from the "home" page is quick and easy, without losing access to core words. *Sono Flex* can restrict the number of icons per page by hiding them, but cannot change button size. It uses Symbol Stix, and can import other images.

The large vocabulary available in *Sono Flex* means more ability to see genuine message construction, more options to push the Zone of Proximal Development during assessment by modeling more complex vocabulary or syntax, and can be a good assessment tool even if you are not considering a Tobii device. (<http://www.tobii.com/sonoflex>)

(fig. 7)

TouchChat HD for iPad contains multiple vocabulary sets and pages for different users. Vocabulary can be customized for specific users or specific assessment contexts. *Word Power* is available as an in-app purchase, for more linguistically complex users. Gateway page set, once available on Dynavox devices, are now available for *TouchChat HD*, as well.

The drawback to using *TouchChat* as an assessment tool is the need to move back and forth between different page sets to access more buttons per page, more complexity of language, different vocabulary organization; this may slow access for some students who aren't good at waiting. It is possible, but time consuming, to build a custom layout for assessment purpose. Additionally, some of the core vocabulary page sets assume literacy in users, which is often not the case. (<https://touchchatapp.com/apps/touchchat-hd-aac>)

(fig. 8)

Proloquo2Go is one of the more popular AAC apps. It is more expensive than many of them, but has more features, as well. The newest, v.4 update offers additional users,

page templates, and access features, as well as limiting navigation. Because *Proloquo2Go* is so robust, it offers more features for assessments than many of the AAC apps.

(fig. 9)

It is possible to move seamlessly from one grid size to another without changing the relative location of vocabulary, making it ideal for the stability of vocabulary location needed to learn AAC competence. It offers access to core vocabulary as well as fringe. The new Intermediate Core user gives SLPs a break, by creating a core vocabulary user with less complexity of vocabulary and, thus, less need to customize the core for younger users.

Within the context of *Proloquo2Go* it is possible to assess the individual's use of morphology and syntax. It is possible to access plurals, possessives, verb tenses, and more without additional programming. You can create custom users for assessment purposes, program specific activity pages based on your assessment bag of tricks, toys, and topics, continue to add comments, descriptors, and more vocabulary, and more from one grid size to another to assess the user and push the ZPD.

Proloquo2Go is also switch accessible.
(<http://www.assistiveware.com/product/proloquo2go>)

Assessing Literate Users with Text-to-Speech Options

A few options are available for text-to-speech users of AAC, and a variety of apps are currently on-line. The simplest is the iMEAN keyboard, which is in high-contrast black and white, with large keys. The user has the option of ABC or QWERTY layout and it offers word prediction. It is under \$5. Some adults with autism have expressed a liking for the large keys and high contrast. (http://www.imean.mobi/iMean_site/Welcome.html)

(fig. 10)

Predictable is a text-to-speech app with word prediction and switch accessibility. Custom messages can be stored in folders for quick access for frequent use. It is available in Spanish. (<http://www.therapy-box.co.uk/predictable.aspx>)

(fig. 11)

Keedogo and *Keedogo Plus* are text to speech key boards available from Assistiveware, the maker of *Proloquo2Go*. These offer bright colors, high contrast, and word prediction and can be used anywhere you need a talking keyboard on your iPad. (<http://www.assistiveware.com/product/keedogo>)

(fig. 12)

Accessibility Issues in iOS

Which apps allow for customizing the color of background and button borders, for changing the size of buttons and displays, and the font in a button?

GoTalk Now allows the user to change the page background, button background and button border colors. The font size and image size on buttons are easily changed within a button. There are 4 different array sizes.

Proloquo2Go allows the user to change button sizes as grid size changes. Background, button and button border, and text color can all change independently. There are many array sizes.

Sounding Board only allows changes to the array size (which changes button size) from 1, 2, 3, 4, 6, to 9 image buttons per page.

TapSpeak Choice changes array size, but button size stays the same.

Sono Flex does not allow for changing array or button size.

Which apps are switch accessible?

Sounding Board, *Proloquo2Go*, *GoTalk Now*, *Avaz* (<http://www.avazapp.com/features/>), *Predictable* are all switch accessible. *GoTalkNow* allows for 2-switch scanning.

Assessing Accessibility on the iPad

Catch the Cow is set up to assess both direct selection and switch access. The task is similar to many of the original device manufacturer's access activities. The cow moves from space to space. The number of specs increases, and the cow moves to all areas of the screen, around all quadrants, and within each quadrant.
(<http://www.computerade.com/catchthecow/CTCuserguide.html>)

(fig. 13)

Dexterity, from Binary Labs, is an O.T. fine motor app which can be used to assess touch access. (<http://www.dexterity.net/>)

The *TouchTutorial Lite* app was specifically designed to test touch and point access.
(<http://touch-tutorial-lite-3tll.appsios.net/>)

(fig. 14)

If you have an individual – particularly a child or an adult with developmental disabilities – who hasn't had a speech-language assessment you can refer to, there are a variety of language apps you can use to look at language skills needed by an AAC user.

Remember, we are not saying these language skills are prerequisites, merely that they are skills the user either has, or needs to be supported to develop, to become a competent AAC user.

Remember, again, that looking at skills in isolation frequently does not tell you much about the user's actual language skills and his ability to use those skills in context. But you may gain some information about his vocabulary comprehension, symbolic awareness, syntax potential, categorization and association skills. Weigh the lack of context against the child's level of engagement with the piece of technology.

Remember that iOS apps are useful in assessment, but do not take the place of actual trials with dedicated devices. Remember also that iOS technology is not the answer for an AAC system for all users.

Making the Decision

Out of the assessment process should come information about what is standing in the way of the individual's ability to successfully communicate, what factors contribute to the individual's successful communicating, and how the individual's current skills and abilities contribute to these factors. By the end of the assessment there should be a clear idea of what the individual needs to do, what he is currently doing to meet these needs, what skills need to be acquired to meet these needs, and what strategies might be used to help him achieve this. (Porter, 2009).

Decision making is the art of matching the information gathered about the individual from all of the available sources plus the assessment and follow-up data, and making determinations about which features of an AAC system meet this particular individual's needs. The environment and communication partners, as well as his own language needs, skills and potentials, and any physical factors that may be involved all need to be considered.

Decision making is ideally the result of a meeting between all members of the individual's support team. The WATI (Wisconsin Assistive Technology Initiative) provides an AT Decision-Making Guide that provides the team with a 5-step decision making process that includes:

- Identifying the problem - defining the specific problem the individual faces
- Generating the solution - listing possible solutions
- Selecting the solution - choosing a solution after evaluating the possibilities, so that a plan can be developed
- Implementation - carry out the plan developed by the team to provide the solution
- Follow-up - meeting to evaluate progress and the suitability of the plan

It sometimes happens that this meeting is not a formal one with all members seated around a table. Understandably, team members discuss things informally when they

find themselves together, but often this leads to information being left out or not understood clearly. It is important that all information be presented in writing, to all members of the team, and that discussions be written down for later review. Brainstorming works best with all members of a team present and willing to contribute. Prioritize needs, sequence priorities.

The SETT framework, discussed earlier, is available from WATI.org as a written template to enumerate the descriptions of the features needed for the system and the possible tools to use. The team needs to determine which tools to use, how to train members to use them, and then plan how to integrate them into the individual's environment effectively.

This is a dynamic process. Many funding sources for high tech devices require a rental period prior to purchase to make sure that the device is appropriate and working. This should be a standard procedure regardless of the funding source.

The support team should monitor progress, and look for any needs that exist or arise, to make changes to the AAC system. Some things - like fringe vocabulary needed - will be a constantly moving target for some users, particularly younger students. With any system, there needs to be a process in place for assuring that it continues to be appropriate, that it continues to grow with the user, and that progress is being made in intervention in a meaningful way.

For individuals with more complex motor issues, access will need to be continually monitored. Changes in positioning or in muscle alignment or contractors need to be accounted for. Sometimes, the impact on the body of using a switch in a specific location can make continued use painful or impossible. Increased fatigue needs to be accounted for. Sometimes multiple access sites may need to be determined to keep the user comfortably accessing the system.

Remember that the system may be a combination of a number of solutions, each of which works in a different context or with a different partner.

Case in Point:

L.J. is a young woman with cerebral palsy who uses a high tech dynamic display device.

She is literate, and on her device uses a combination of symbol buttons, word buttons, and the keyboard. She uses the device in public, when speaking with unfamiliar or infrequent communication partners. She also has a word-based notebook that hangs from the side of her wheelchair, which more familiar communication partners, such as caregivers and family members, often use for quick messages. She also has a single page alphabet board that her most familiar partner uses with her. It all depends upon the place, the person, and the message.

She has not changed the system in a long time, but it has been refined constantly since her childhood, throughout her acquisition of literacy and vocabulary, and changes in her environment and home life.

An AAC assessment does not attempt to find a technological solution to a communication problem. Rather, it attempts to find a way in which the individual can communicate and engage effectively and meaningfully with a variety of communication partners in a variety of communication situations, including social, daily living, academic, and employment contexts.

The focus should be on the individual communicating, not on the technological tool.

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INTERNET RESOURCES:

www.aacoinstitute.org

Core vocabulary information

www.aacintervention.com

Lots of information about AAC from where to start with literature-based boards to tips and tricks. Musselwhite, C.

www.adaptivationinc.com

Catalogue of devices, switches, and more

www.asha.org/docs

ASHA's site contains position documents, and documents outlining their stand on the knowledge and skills, roles and responsibilities of SLPs regarding AAC

<http://autismpdc.fpg.unc.edu>

Lists all evidence based practices for autism spectrum disorder, including overview, intervention steps, and check sheets

www.candlelightstories.com

Some ebooks are free; full access costs about \$10

www.creativecommunicating.com

Patti King-Debaun's website offers materials for teaching literacy to AAC users

www.enchantedlearning.com/Rhymes.html

\$20 membership required for full site, but symbol-adapted nursery rhymes are free

www.lindaburkhart.com

Offers a multitude of free handouts on intervention in AAC with students with complex communication needs, cortical vision impairment, Rett syndrome, PDD communication books, and more, as well as how-to handouts for building switches and mounts

<http://www.novita.org.au/Content.aspx?p=683>

PODD information and workshops

www.paulakluth.com/articles

Ideas for adapting books, including students in general ed classrooms

www.pdictionary.com/

Internet picture dictionary provides symbols with English and Spanish words for use in adapted books or communication displays

www.prentrom.com

Look for AAC Language Lab for step-by-step intervention targets, IEP objectives, and plans. This is also the source for the Pixon Project Kit by G. Van Tatenhove

www.storyplace.org

Charlotte & Mecklenburg County public library has preschool stories with text, dialogue is highlighted, accompanying games

<http://www.usu.edu/teachall/text/reading/Frylist.pdf>

Fry's instant sight word list - all 300

www.vantatenhove.com

Gail has many handouts here on using core vocabulary, descriptive teaching, teaching Unity/Minspeak, and samples of the Pixon boards

AUGMENTATIVE-ALTERNATIVE COMMUNICATION: ASSESSMENTS

What Are We Looking For and How Do We Find It?

2 CE Hours / .2 CEUs

FINAL EXAM

1. Dietz, et al (2012) studied a group of SLPs with differing levels of experience in AAC evaluation. They found: _____.
 - a. SLPs with more general practice experience approached the assessments in a holistic fashion
 - b. SLPs with more AAC experience (either in practice or research) approached the assessments in a linear fashion
 - c. The general practitioner SLPs were more focused on individualizing the communication experience
 - d. The more clinical and research-based SLPs with AAC experience tended to look more at the individual's overall communication skills and needs

2. The _____ looks at the individual's functioning in relationship to the environment and its activities within which he must function or participate.
 - a. Testing session approach
 - b. Ecological approach
 - c. Decontextualized approach
 - d. Referral approach

3. The SETT framework asks team members/assessors to determine information about the: _____.
 - a. Student, Environment, Tasks, Tools
 - b. Student, Environment, Technology, Team
 - c. Subject, Education, Tasks, Team
 - d. Subject, Environment, Topics, Team

4. When gathering background information prior to an assessment, questions like "Can this individual read and/or write/type? At what level?" help to determine the status of an individual's _____.
 - a. Language skills
 - b. Preferences
 - c. Communication skills
 - d. Literacy skills

5. _____ is also an inventory, and provides for gathering information about the individual's sensory-motor, attentiveness, receptive and expressive language skills,

pragmatic/social language skills, speech and voice, oral-motor, fluency, and non-oral skills.

- a. The Communication Supports Inventory - Children and Youth by Charity Rowland and Melanie Fried-Oken
- b. The Communication Matrix, by Charity Rowland
- c. The Functional Communication Profile, published by Pro-Ed/LinguiSystems
- d. The Test of Aided-Communication Symbol Performance (TASP), published by Mayer-Johnson and developed by Joan Bruno

6. The clinician(s) should sit with the individual and offer a variety of topics or activities, as well as have available _____.

- a. A variety of communication displays
- b. A variety of partners
- c. A variety of distractors
- d. A variety of profiles

7. If it is known or suspected that an individual has _____ (which are often found in individuals with cerebral palsy and, increasingly, in individuals with autism), displays will need to be prepared that address these specific needs. This can include making assessment pages with larger symbols and utilizing color contrast, including use of specific colors or the high contrast symbols offered by Mayer-Johnson's PCS.

- a. Fine motor impairments
- b. Visual acuity issues
- c. Difficulty vocalizing
- d. Cortical vision issues

8. Symbols that have _____ are those whose meaning may not be immediately recognized, but which make sense once explained.

- a. Color contrast
- b. Less transparency
- c. Multiple meanings
- d. A hierarchy

9. One of the biggest advantages of color cues - especially during ALgS and modeling - is that they remind the communication partners talking with the AAC user to pay attention _____.

- a. To the symbol array size
- b. To the kinds of choices they are offering
- c. To the number of symbols per page
- d. To the student

10. _____ include the head mouse, head tracker, joystick, and mouse emulators.
- Low tech AAC devices
 - Larger displays
 - Alternate access modes
 - Dynamic display systems
11. An individual can be _____ (in charge of creating his communication messages where and to whom he wants, with few restrictions on what he can say) without being _____ (able to say something without assistance).
- Autonomous / Independent
 - Intentional / Comprehensible
 - Independent / Autonomous
 - Independent / Comprehensible
12. _____ vocabulary boards and books focus on providing students with those words that research has shown to be the most-used to generate language responses.
- Pragmatic
 - Core
 - Fringe
 - Contextual
13. The communication requirements in a school are significantly different from other environments: _____.
- Often answering questions in class requires understanding and using contextualized language
 - Teachers, partners, and caregivers ask for similar kinds of responses
 - There is often more social language needed and less emphasis on responding
 - Working in classroom groups requires mediation and self-advocacy skills, in addition to the specific language skills of the lesson.
14. The _____, a concept introduced by Lev Vygotsky in the 1930s, is the difference between what an individual can do without help and what he can do with support.
- Zone of proximal development
 - Window of opportunity
 - Psychology of play
 - Pragmatic branch starter
15. Often students and adults with developmental disabilities come to AAC assessments having been given only the tools to _____.
- Direct others' actions
 - Ask and respond

- c. Comment and protest
- d. Make choices or requests

16. It is difficult for many SLPs to make _____ available for assessments.

- a. Paper-based displays including PODD communication books
- b. Core vocabulary books and displays
- c. An array of dynamic display technology
- d. Different types of switches and alternate access technology

17. _____ makes some free apps that can be useful in assessment, particularly with users who have had stroke or brain injury, or who have developmental delay.

- a. Prentke Romich
- b. Lingraphica
- c. Dynavox
- d. Tobii

18. A few options are available for text-to-speech users of AAC, and a variety of apps are currently on-line. The simplest is _____.

- a. Keedogo Plus
- b. GoTalk Now
- c. The iMEAN keyboard
- d. Sono Flex

19. In looking at customization in apps, _____ allows the user to change button sizes as grid size changes. Background, button and button border, and text color can all change independently. There are many array sizes.

- a. Proloquo2Go
- b. Sono Flex
- c. TapSpeak Choice
- d. Dexteria

20. Decision making is ideally the result of a meeting between _____.

- a. The individual and his communication partner
- b. The caregivers and the clinician
- c. The school district and the parents
- d. All members of the individual's support team