

Upfront



In the sixties and seventies body language was a popular topic of magazines and books. Now, the popular press seems more interested in body building than body language. I recall learning about Birdwhistle's research on nonverbal communication back then... when I was in graduate school. Reflecting, I also realize that every single augmented communicator I've ever known has used gestures (no matter what other AAC techniques they've used); and many have used them quite creatively and very effectively. Yet, in our literature and at our conferences, there has been little attention paid to the role that gestures play in AAC intervention.

Gestures can play many roles in enhancing the communicative competencies of someone who relies on AAC. Little is currently known about how various AAC system components interact with an individual's use of gesture, or how the use of gesture affects the development of other AAC modalities. One valuable role gestures play is to "disambiguate" messages. For example, if someone understands but cannot produce the names of objects clearly (e.g., says the same sound "kuh" for car, cup, candy, etc.), the message may not be understood. Gestures (pointing or manual signs) can increase the intelligibility of an augmented communicator's output and thus increase the efficiency, ease and

success of interactions. Another role gestures can play is enabling people who are at a non-symbolic level to have a means of expression. Requiring someone to use speech or graphic symbols for communication before they are ready or capable may contribute to communication failure and reduce the person's desire to communicate (thus feeding into a passive communication style).

Why should AAC professionals, augmented communicators and parents/caregivers care about gestures? As Susan Goldin-Meadow said, "Gestures are an important window to the mind, one that

Continued on page 2

Clinical News



Gestures in AAC with Mary Hunt Berg

Gestures are actions performed with the intent to communicate. They also are an adjunct to speech, adding to the meaning of utterances. Gestural actions involve the use of fingers, hands and limbs (waving, pointing, pounding), facial features (blowing a kiss, a grimace) and total body movements (bouncing up and down)²

Gestures enhance meaning for both speakers and listeners.³ They can function as utterances, standing on their own (e.g., thumbs up), or as components of utterances. Some

inside this issue

Clinical News

Gestures in AAC

Case Examples

Carlos and Billy

For Consumers

Myths and realities

Assessment

Assessing gestures

Intervention

Teaching gestures

On the Web

Websites on gestures

The AAC-RERC

RERC projects: Year 2 update

gestures alternate with speech ("It goes like this..." he said, making a circular motion). Other gestures

accompany and can facilitate speech (moving hands while giving directions). Gestures, like speech, perform important communicative functions. They also help define the unique interaction styles of each person.

When speech is unavailable, gestures become an even more critical component of an individual's communication system. Gestures play an important role across the lifespan for all people, especially those who rely on AAC.⁴ Some augmented communicators use manual signs, but everyone uses

Continued on page 2

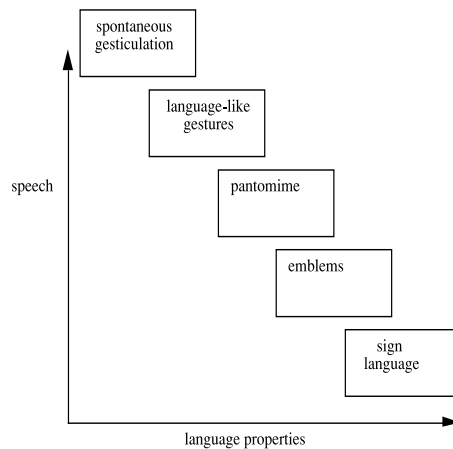
Clinical News, Continued from page 1

gestures to regulate interactions and convey information more efficiently. In AAC, gestures are referred to as a type of “unaided” communication and are readily used in combination with other AAC techniques.

Kendon continuum

Kendon, a gestural researcher, proposed that gestures exist along a continuum. In this continuum, as described below and depicted in Figure 1, the obligatory presence of speech declines as (1) the language-like properties of gestural behaviors increase and (2) idiosyncratic gestures are replaced by socially regulated signs.⁵ Kendon’s continuum is useful both in observing and describing how people use

Figure 1. The Kendon continuum



gestures:

◆ **Spontaneous gesticulations.**

Spontaneous gesticulations are on one end of the continuum.

While seemingly unintentional and nonlinguistic, they accompany and facilitate the process of speaking. They do not occur without speech.

◆ **Language-like gestures.**

Language-like gestures are iconic and metaphoric, but they lack consistency and are context-dependent. For example, a circular movement may refer to “a tape recording” or “returning” or “repeating.” Meaning depends on the message being conveyed through speech.

◆ **Pantomime** is a way of conveying information using gestures to depict an event, experience or feeling. Pantomime requires the use of shared conventions, but there are no linguistic rules underlying the meanings conveyed. A sequence of pantomimed gestures functions like a series of snapshots rather than a linguistic utterance.

◆ **Emblems** are single gestures that have well-defined meanings. Emblems differ from culture to culture, but often express positive feelings or insults and obscenities, e.g., expressing an opinion about someone’s driving behavior. Emblems differ from real language forms in that they are not typically combined in sentence-like utterances. Emblems do not need to be accompanied by speech.

◆ **Sign language** is at the linguistic end of Kendon’s gesture continuum. Sign languages are a visual form of language. Single manual signs have specific meanings and are combined with other manual signs according to specific rules (syntax). When augmented communicators use

Upfront, Continued from page 1

researchers ignore at their peril.” Gesture is a widespread and robust phenomenon, occurring across ages, tasks and cultures.¹

Our Berkeley CA AAC Study Group began reading and discussing the role gestures play (or should play) in AAC intervention almost one year ago. Without this group, most particularly Mary Hunt Berg, this issue of ACN would not exist. She and Filip Loncker provided much of the content. Mary Wrenn, Nicole Liborin, Elisa Kingsbury and Naomi Dayton contributed case examples (unfortunately we were able to use only two). Also, Mary Hunt Berg and Filip Loncker presented some of this information at the ISAAC Biennial Conference in D.C., August 2000.

Clinical News introduces information about gestures and the role they play in the development of communicative competence.

Case Examples shares informa-

tion about the gestures two young augmented communicators use with peers, teachers and parents.

For Consumers points out myths and facts about gestures. The **Assessment** and **Intervention** sections offer suggestions to incorporate into our clinical practices. Finally **AAC-RERC** summarizes current progress in research activities at the lead institutions participating in our AAC “virtual” research and engineering center.

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P.S. Don’t forget to check out our website (www.augcominc.com)



manual signs, they typically function as emblems, rather than as sign language.

Cultural basis of gestures

The meanings of specific gestures vary widely, depending on the functional and cultural context. In the USA, for example, a shrug of the shoulders means *I don't know*. A head crooked to the side may mean, *I'm thinking about that* or *I'm not sure*. Gestures such as crossing your fingers to mean *good luck* are culture-specific. When visiting another country, people may inadvertently use gestures that have meanings they are unaware of. For example, in Thailand, pointing with one's foot is an insult, while in the West, it can mean *it's over there*.

Gestures can be taught

The development of meaningful gestures is a collaborative process, *i.e.*, it is dependent not only on a person's intent to convey meaning, but also on the partner's recognition that a message is being conveyed.

Gestures, by definition, may be unconventional or even unintentional to be communicative. Many children and adults who depend upon AAC have communicative signals that are difficult to observe and interpret. Nevertheless, idiosyncratic signals can (and do) develop into meaningful gestures. Readability (the ease with which partners can assign meaning to a physical behavior) and predictability (the ease with which partners can predict the meaning of behaviors in a specific context) often determine whether a gesture becomes part of a person's communicative repertoire.⁶ In fact, individuals who use AAC techniques often create their own idiosyncratic gestures. For example, Tony, who has cerebral palsy and

Table 1. Development of Gestures (adapted from Volterra & Erting, 1994)⁷

	Deictic Gestures	Representational Gestures
Communicative function	To engage the adult as tool. To attain shared attention and establish reference.	To establish reference. To carry some fixed semantic content
Types	Showing Giving Reaching Pointing	Symbolic gestures: Object-related, represent aspects of the referent. Social markers. Culturally defined conventional YES, NO, BYE-BYE
Origin	Emerge from early motor skills (9-11 months)	Emerge from familiar games, routines & actions before words.
Determination of meaning	Interpreted only in relation to present context.	Convey a fixed meaning or semantic content across contexts or partners.
Link to referents	Context bound: unlimited number of referents in the present context	Convey meaning in the absence of the actual referent.
Developmental process	Contact: Contact with object or person (giving an object, pushing an adult's hand.) Proximal: Hand does not touch person or object (pointing and reaching). Distal: Coincide with increased use of coordinated attention with the adult.	Whole body enactment based on an action performed on objects (<i>e.g.</i> , sniffing to name a flower) or an action performed by an agent (<i>e.g.</i> , panting to name a dog). Request and attribute gestures: "knob turning" to go out; "moving hands up & down" to play piano; "blowing" for hot, "raising hands" for big.

uses a range of AAC strategies, wiggles his foot when he wants to talk about Nintendo. This gesture emerged because he runs the controller with his foot.

Development of gestures

Early gestural development (like speech development) requires that adults collaborate with children to create shared meaning. This requires that adults both recognize and respond to a child's gestures as meaningful communication signals. For example, when a "bouncy game" is interrupted and the child wants it to continue, the parent infers meaning from the child's behavior (bouncing) and may say, *Oh, you want to do it again!* Recognizing behavior as meaningful and then labeling it increases the likelihood that a meaningful gesture will become established.

Table 1 depicts how gestures develop in young children. First to emerge are **deictic** gestures. They are nonrepresentational and context bound. Pointing, reaching and giving are examples of deictic gestures. Initially, children use these as contact gestures, then proximal

and, finally, as distal gestures. Representational gestures also develop early. These gestures often have fixed references and emerge from daily routines.⁷

Ten reasons to encourage gestures

There are many reasons to increase the gestural repertoires of augmented communicators.

1. Gestures are always available and do not require equipment.
2. Gestures convey information efficiently. Augmented communicators can use gestures to make interactions more efficient, which will enhance communicative competence.
3. Everyone uses gestures. Gesturing is integral to the communication process and may reflect or even facilitate the thinking that underlies spoken language.⁵ Children who are blind use gesture despite having never seen a gesture.⁸ Deaf children not exposed to speech or sign language spontaneously invent


Continued on page 4

Clinical News, Continued from page 3

- language-like “home sign” systems.⁹ People with severe physical impairments often use gestures that convey meaning.
4. Even highly subtle gestures are interpretable. Sign language researchers are still discovering how deaf individuals assign meaning to the facial expressions used in conjunction with manual signs. Ongoing research suggests there are at least 50 morphological markers, *i.e.*, meaningful units expressed in facial movements, that occur on the face in American Sign Language—ASL. In sign language, the face provides prosody (tone of voice and intonation), and eyebrows are used as conventionalized morphological markers.¹⁰
 5. Gestures are useful across the life-span. AAC clinicians can facilitate the use of gestures in each individual’s AAC repertoire, even those with restricted movements, and as a result build communicative competence for the future.
 6. Gestures may help develop internal representations/concepts. When infants begin to use gestures, they are not aware their bodies are a medium of expression. Early gestures depict actions, not referents or their properties. For example, when drinking from a cup, a child is building a mental representation of what a cup does. Only later will the child’s concept of cup include his knowledge that it is a drinking utensil, a round object with a handle, and so on.¹¹
 7. Gestures are important for communication development. Early gestural production func-
- tions “much like the boosting stage of a rocket propelling early productive language”¹² Developmentally young children may practice initiating and responding, turn-taking, requesting and sharing using simple gestures long before they begin to use words, manual signs, AAC devices and graphic symbols.
8. Gestures may actually facilitate the development of symbolic abilities. Encouraging someone to use physical behaviors in symbolic ways may facilitate the eventual use of other symbolic forms.¹³
 9. Enhanced gestural input may benefit language development. Enhanced gestural input occurs when adults mindfully use gestures and signs (invented or borrowed from sign languages) to facilitate early speech and language development. Researchers and clinicians are now encouraging parents of young children to use “enhanced gestural input” with children because gestures are so closely and supportively linked to achievements in language development.^{13,14} Before and during the one word phase, for example, children seem able to utilize input in both forms (gesture and spoken language). Some favor gestures; others gravitate toward spoken words. The extent to which children develop a predominance of gestural communication may depend on the severity of their delay in developing speech.^{11,15}
 10. For individuals who do not understand that pictures represent a specific existing reality, gestures provide access to meaningful expression. Research

suggests that it may be developmentally inappropriate to use pictures as symbols at early stages of development,¹⁶ especially when gesturing is possible. In typical development, children understand and use physical gestures as symbols at about 12 months—the same time they begin using words.^{13,17} However, typically developing children do not understand that pictures represent a specific, existing reality until they are almost three years old.¹⁶

Summary

Research and best practices suggest that people who have severe speech impairments and rely on augmentative communication techniques benefit greatly from the use of gestures in their daily activities, throughout the life span. To maximize these benefits, we need (1) to understand more clearly basic information about gestures and the role they play in the development of communicative competence, (2) to appreciate the many reasons for encouraging the use of gestures among augmented communicators and (3) to learn how to support and reinforce the use of gestures more effectively. 

Case Examples



Carlos and Billy

As the Berkeley Study Group members began learning about gestures and applying what we learned to our clinical work, we began to notice many more ways augmented communicators were using gestures and how essential gestures were to successful interactions. Two brief examples follow:

Example #1: Carlos, a 6-year-old boy with cerebral palsy, spastic quadriplegia, severe hypertonia and a seizure disorder, relies primarily on his left hand for fine motor tasks. He has a manual wheelchair for mobility, but he is only able to push himself for short distances. He lives in a bilingual household and is included in a first grade classroom, with support from a special education teacher, instructional assistant, speech/language pathologist, occupational therapist, assistive technology specialist, adaptive P.E. teacher and physical therapist. His receptive language skills are moderately impaired, and approximate a three- to four-year-old level. His speech is severely dysarthric and intelligibility is poor. In addition to vocalizations and word approximations, Carlos uses a DynaVox, language boards, manual signs, gestures and miming to communicate.

Gestural repertoire: Carlos uses spontaneous gesticulations, language-like gestures, pantomime and emblems (manual signs) to clarify verbal attempts and/or discuss topics not accessible with his DynaVox or language boards. For example:

◆ When asked what he had done the previous weekend, Carlos used both hands together to mime using a light saber, in order to explain he had watched “Star Wars.”

- ◆ He pointed to the ceiling and shivered to explain that a loud noise on the roof scared him.
- ◆ He bared his teeth and bit while pointing to the multi-use room in order to explain there had been an assembly with an alligator that day.

Other students in his class serve as interpreters and understand many of his gesture/signs. One classmate explained that by pointing to the *pumpkin* on his language board and then making an I LOVE YOU sign directed toward the floor (similar to the way Spiderman shoots webs from his wrist), Carlos was telling everyone he was going to be Spiderman for Halloween.

Example #2. Billy is an eight-years-old boy with an acquired encephalopathy. His academic and language skills are delayed, approximating the five-year level. He has excellent social skills and is enrolled in a special day class in a non-public school—with 20% of his day in a second grade general education class. He uses speech approximations, gestures, manual signs, communication displays with graphic symbols and a Vanguard AAC device with Unity software to generate utterances for which he knows the symbol sequences. On low-tech displays, he combines one or two symbols with gestures to produce messages.

Gestural repertoire: Billy uses spontaneous gesticulations, language-like gestures, (thumbs up/

thumbs down), emblems (invented signs and manual signs like FINISHED, PLEASE) and mime. Examples of his gestures are:

- ◆ Points hand toward speaker and “clicks” the remote button (Be mute/stop talking.)
- ◆ Drums on his cheek (Wait a minute.)
- ◆ Taps his temple (I’m thinking.)
- ◆ Hand up (Stop.)

He mimics actions using his whole body and his hand.

- ◆ When he saw a boa constrictor at a school assembly he imitated the way it wriggled its body and moved its tongue as he watched it.
- ◆ After a helicopter flew over the playground at recess he moved his hand in circles over his tray and pointed to the sky.

Summary

Yogi Berra said, “*You can observe alot just by watching.*” By observing people like Carlos and Billy from the specific point of view of their gesturing habits, we are able to get a more complete picture of their communicative competence.



For Consumers



Myths and realities

with Filip Loncke

Myth #1. *Gestures can slow down the development of speech and decrease a person's motivation to talk.*

Reality. This is an ever-recurring myth! Exactly the same is said about manual signing, graphic symbols and voice output communication devices. This myth is also known as the “incompatibility hypothesis.”¹⁸ No research supports it. On the contrary, hundreds of case studies show individuals can and do acquire speech after learning other communication systems first, just as people acquire multiple languages. For example, thousands of hearing children with deaf parents develop sign language as their first language and learn to talk later on.

Also, when people learn to read and write, they use graphic symbols. If the incompatibility hypothesis were correct, the more literate someone became, the more speech would be lost. Instead, individuals who are frequent readers are often more fluent speakers.

As for gesture, there is an impressive amount of evidence that gestures help launch speech development. Thus, researchers and clinicians are now encouraging parents with young children to use gestures and a number of manual signs (from sign language) to facilitate their child's early speech and language development.¹³

Clinical and experimental reports of AAC users demonstrate that individuals who rely predominantly on gestures in presymbolic stages of

communication often transition to using symbolic communication forms.¹⁹ There also is evidence that gestures

can help people access speech, and may actually enable individuals with word finding difficulties (the tip of the tongue phenomenon) to retrieve a word. For some adults with aphasia (a severe difficulty in using language and speech), gestural therapies have been used to improve language and communication skills.²⁰

Myth #2. *By using gestures, a person will lose the motivation to use other communication forms.*

Reality. This myth assumes that the “law of effect” and the “law of least effort” guide people's communication behavior.²¹

- ◆ The “law of effect” states you will be satisfied once you reach your goal. If gesturing gets you what you want, you won't bother to use anything else.
- ◆ The “law of the least effort” implies you will not want to invest time and energy learning different forms of expression if you can do the job the easy way, *i.e.*, by gesturing.

Both are misleading. Each disregards issues of effectiveness in communication. Gestures, because of their inherent limitations, may actually motivate people to learn linguistically-based communication forms. For example, you're more likely to get the snack you want if you combine a pointing gesture with a graphic symbol or word.

Myth #3. *Gestures can only be used if the motor system is intact.*

Reality. Gestures are like handwriting—each person has a gestural style that reflects his or her person-

ality. Some use big, expressive gestures whenever they speak, while others use small gestures rather infrequently.

Individuals with motor impairments may use gestures in ways that are different and perhaps subtle, but their gestures are still appropriate and can be meaningful when others understand them. Gestures, even idiosyncratic ones, can help get a point across, structure a message, indicate the need to say something, and convey agreement or disagreement with what is being said. Unlike manual signs, there are no strict rules about how to produce a “good” or “appropriate” gesture. All individuals have different gesturing styles. What counts is effectiveness.

Myth #4. *Gesture and sign language are the same.*

Reality. While gestures develop alongside spoken language, sign languages develop as a substitute for spoken language. Gestures and manual signs may look alike and may even be identical, but there are major differences. First, the manual signs of sign language are produced and sequenced according to grammatical rules widely accepted by the linguistic community. Sign language users can tell you when you've made an error, much like speakers of spoken languages can correct your mispronunciations and syntax. Gestures are not language and carry no strict rules. Also, no one is likely to say, “Hey, you used the wrong gesture.”

Myth #5. *When you use manual signs and gestures as supplements to speech, you are using sign language.*

Reality. Many people who have difficulty talking learn to use some “signs” to express ideas and refer to persons and things. Typical manual signs taught are TOILET, MORE and FINISHED. When someone

uses manual signs, it does not mean he is using sign language anymore than it means someone who says, “I want a burrito,” is speaking Spanish.

Fluent signers of ASL will sign MORE YOU? with raised eyebrows, tilting their head slightly backward to mean, *Do you want more?* In contrast, individuals who use a few manual signs as AAC symbols are likely to sign MORE and then point to a graphic symbol or a person to ask, *Do you (or someone else) want more?* The language of the AAC user in the example is English. The manual sign serves as a meaningful gesture that accompanies an utterance.

Myth #6. *Gesture is only important at very early stages of communication development.*

Reality. Gestures continue to play an important role throughout the life span. Psycholinguists like McNeill believe that humans who speak are using a double channel system—spoken and gestural.⁵ Gestures serve as both a support and rescue system. For example, in giving directions, most people use gestures.

Myth #7 *As speech output communication devices become more advanced, gestures and signs will become less useful.*

Reality. Even when we have equipment ten times more sophisticated than we now use, speech itself is very unlikely to disappear and neither will gestures. Speech and gestures are basic biological functions in humans. Some anthropologists and psycholinguists feel that human gestures are even more deeply rooted in our genetics than speech. While this is controversial, the fact remains that gestures are acquired naturally and are used by humans to master, convey and receive information.

Myth #8. *The use of gestures occurs in a similar fashion across all cultures.*

Reality. It is important to pay attention to the background and the culture of an augmented communicator before introducing gestures.^{5,22} Gestures are used more explicitly in some cultures than others. The stereotype is the Italian man who shouts, moves his hands and waves his arms to make a point. In the Japanese culture, men and women are more restrained in their use of gestures. In southern European nations, wide gestures are common and perceived as normal, but people in Nordic European countries may interpret those gestures as inappropriate or bizarre. Also there are conventions for male and female gesturing. Making the wrong gesture to another driver on a Los Angeles freeway can constitute a life-threatening act.

AAC users are more likely to learn gestures that are emphasized, visible and acceptable within their communities. Thus, in cultures where gestures are used more discretely, clinicians may discuss with the person and caregivers the type of gestures to encourage.

Myth. #9. *The purpose of gestures is to clarify the messages of a speaker so the listener will understand them.*

Reality. Gestures are used regardless of whether the listener understands the message. This is obvious during phone conversations, when people often wave their hands even though their communication partner can not see them. One role gestures play is to help speakers plan messages and access sentence structures and words.

Summary

Gestures are an important

component of everyone’s communicative repertoire. This section discussed some of the myths that surround the use of gestures. These myths can be harmful. They can limit the way AAC professionals, augmented communicators and family members think about gestures. In our current clinical practices, too little consideration is given to gestures. The reality supports a need to pay serious attention to the use of gestures throughout the life span of each person who relies on augmentative communication devices, techniques and strategies.



Assessment



child's gestures differ from those listed in the inventory, the format can help parents understand what types of gestures to look for.

Assessing gestures with Mary Hunt Berg & Filip Loncke

This section suggests ways to assess the gestural behaviors of augmented communicators. The approaches discussed include parent/caregiver report, interviews with augmented communicators and their partners, naturalistic observations and tasks that elicit gestures. These approaches are not mutually exclusive. More than one approach may be needed to insure a valid and reliable assessment

Parent/caregiver report

Parents, spouses and others close to an augmented communicator have valuable information about how the individual communicates. In addition, the greater the communication partner's knowledge about AAC techniques, the better. Thus, involving primary partners in the assessment process makes sense. Two ways to collect information are:

Diary. A diary describing specific gestures, when they are used, how they are produced and whether they occur in combination with vocalizations, graphic symbols, speech and AAC devices can provide valuable information about a person's gestural repertoire. Diaries can also reveal patterns of gestural development over time and information about the use of other AAC techniques.

Checklist. A portion of the *MacArthur Communication Development Inventory: Words and Gestures* includes commonly produced gestures, actions and play behaviors for use with very young children.²³ Even when a particular

Interview

Interviews with augmented communicators and/or primary communication partners enable service providers to ask about daily routines, and how the person communicates special needs or requests across contexts. Interviews are often used in conjunction with other methods.

Interview questions

How do you know that ___ wants more food?

How do you know ___ has enough food?

When ___ is frustrated, how do you ascertain the reason for the frustration?

How does ___ refuse something?

Questions like the ones above, along with naturalistic observations, allow speech-language pathologists and others to understand more about the gestures and other modes a person uses with familiar partners.

Signal inventory. In 1991, Hunt Berg and Blackstone developed a tool to assist in gathering information from parents and service providers about the gestural behaviors a person uses to express various communicative functions.²⁴ (See

Cynthia Cress's website for a recent example: www.unl.edu/barkley/present/cress/csichart.html)

Personalized gesture dictionary.

As depicted in Table 2, a gesture dictionary contains information similar to the signal inventory. An AAC team develops the dictionary early in the intervention process and can use it to measure progress.²⁵

Naturalistic observations

Service providers can learn methods for observing gestures for brief periods of time, across contexts and partners. Sometimes natural observations can help identify subtle communication behaviors that otherwise would have gone unnoticed. The Readability Chart in Table 3 is helpful in structuring naturalistic observations.⁶

For a highly detailed analysis of gestures, the CHILDES system now includes options for coding the gestures and signs produced during natural interactions (childes.psy.cmu.edu).²⁶ Although language researchers are the primary users of the CHILDES system, speech-language pathologists may find it increasingly helpful. It now offers conventionalized transcription and coding schemes for a detailed analysis of gesture and manual signs, in addition to spoken language.²⁷ The potential

Table 2. Personalized gesture dictionary

WHAT JOHN DOES	WHAT IT MEANS	HOW TO RESPOND	COMMENTS
Knocks on the table.	John wants food.	Give food and say, "You want food." "You are hungry."	Gesture can be made less idiosyncratic when partners use it also.
Takes you by the hand and pulls you toward something	John wants you to do something for him.	Follow John and interpret when you discover what he wanted.	May want to shape and model a "pointing" gesture.
Moves his hand quickly while looking at a drawing pad.	John wants to draw or color.	Give him the drawing pad. Comment on it.	The movement can be shaped to teach the WRITE sign.

Table 3. Determining the readability of gestures
(adapted from Kublin, Wetherby, Crais & Prizant)⁶

Social-affective communication	Does the person use physical behaviors (such as directed gaze and facial expression) to regulate interaction, attention, and indicate emotion?
Range of communication functions	What are the child's reasons to communicate, <i>e.g.</i> , behavior regulation, social interaction, joint attention? How do you know what the person wants?
Sophistication of communicative means	What is the person's gestural repertoire. How many meaningful gestures does the person use and under what circumstances? What are the quality of the gestures--contact vs. proximal vs. distal; re-enactment vs. symbolic? Do gestures co-occur with other communicative forms--vocal, verbal, word approximations, signs? If so, do gestures primarily complement spoken messages or supplement them?
Frequency of use	How frequently does the person use gestures during interactions with others?
Repair strategies	Does the person use gestures to repeat, emphasize or clarify intentions when not understood?
Capacity to symbolize	Does the person engage in symbolic activities? Does the person imitate or try to imitate other's actions with common objects? Does person repeat actions or events to make them reoccur? Does the person use symbols: words? signs? graphic symbols?
Scaffolding gestural abilities	What contexts seem to elicit or generate gestural behaviors? Which partners seem to elicit or generate gestures?

application of this approach to research in AAC was discussed at the ISAAC's Research Symposium in August 2000.

Eliciting gestures

Imitation. One way to elicit gestures is to ask an individual to produce the adult form of a gesture. One procedure, originally used by researchers to explore the relationship between a person's ability to imitate gestures and subsequent language development, asks individuals to imitate single gestures or sequences of gestures following an adult model. Imitation tasks can quickly suggest whether someone is able to learn new gestures and retrieve symbols. Research suggests these tasks can be used to differentiate children who are truly language delayed from those who are "late bloomers."¹¹

Communication temptations. Another way to elicit gestural

communication from children is to use the "communication temptations" section of the *Communication and Symbolic Behavior Scales (CSBS)*.²⁸ These tasks elicit a child's use of gestures, vocalizations or words without relying on adult verbal prompting. The temptations include structured play formats such as wind-up toys, balloons, bubbles, peek-a-boo, Cheerios in a closed jar, toys hidden in a bag and books. These tasks may be used separately from the entire *CSBS* battery.

Other tasks. Other tasks that may elicit gestures are borrowed from research paradigms. Effective ways to elicit gestures include: (1) asking someone to give directions to a specific location, (2) retelling a story about some adventure and/or (3) participating in conservation tasks and explaining why quantities don't change. Depending upon the type of gestures a clinician wants to elicit,

these tasks can provide valuable information.

What do these data tell us?

Because a major goal of AAC intervention is to increase communicative competence across the life-span, the more we know about all aspects of the person's communication system, the better. An assessment of gestural behavior answers some important questions: "Does an individual use meaningful gestures? How effectively? For what purposes? How frequently? It also helps clarify what modes a person relies on and under what circumstances.

Fortunately, researchers have developed some new and useful tools that can make the assessment of gestural behavior more systematic and more accurate. It behooves us to become better informed about the ways in which these tools can support and improve clinical practice.



Intervention



Teaching gestures with Mary Hunt Berg

All augmented communicators use gestures. Many use gestures as a preferred mode of communication in specific situations. This is true for those who are literate and competent AAC device users, as well as those who are at early stages of communication development. Together with limited speech, gestures can be a faster and more efficient way to achieve shared understanding than using graphic symbols or VOCAs.²⁹

An AAC assessment helps determine which gestures are already in use and which behaviors can be shaped into more effective communication acts. During daily activities, there are multiple opportunities to shape physical signals and behaviors into gestures.

The transactional nature of communication is reflected in the “input, intake, output, and uptake” paradigm.

- **Input** refers to the social and linguistic context, *i.e.*, the amount and type of language (spoken, graphic, manual) a person is exposed to over time.
- **Intake** refers to an individual’s understanding of language and other forms of communication over time.
- **Output** refers to the augmented communicator’s expressive repertoire—the quantity and quality of speech, manual signs, gestures, graphic symbols and speech output from a device, *etc.*

that a person produces in natural contexts.

- **Uptake** refers to the partner’s understanding of the augmented communicator’s output, *i.e.*, the intelligibility (comprehensibility) of the communication acts produced.

Each component of this paradigm co-occurs with the others, contributing to the communication process. A useful way to help plan for AAC intervention is to consider each component of the process. In a previous issue of *ACN* (volume 10, #1 and 2), the paradigm was used to organize intervention planning for the development of language in individuals who use AAC.³⁰ In this issue, however, “input, intake, output and uptake” are used to help us think about how to increase the quantity and quality of an augmented communicator’s gestural repertoire. The paradigm reflects the complexity of the communication process and seeks to clarify specific components for intervention.

Some ideas follow that may assist clinicians, teachers and family members who wish to support the use of gestures. The augmented communicator produces messages and needs to understand what people are saying/doing. Partners provide essential input and also interpret the output (including gestures of the augmented communicator).

Input

To support the development of an augmented communicator’s gestural repertoire, speech-language pathologists and others can teach primary partners about the importance of gestures and help them recognize, value and respond to the augmented communicator’s gestural behaviors.

Examples are:

- Giving partners information about how gestures develop and teaching them (1) what to look for, (2) how augmented communicators use gestures and (3) what they can expect. This can help partners provide more appropriate input.^{5,11}
- Helping communication partners to notice and interpret idiosyncratic gestural behaviors as meaningful, so they can give input in ways that facilitate successful interaction and learning.
- Providing gestural feedback. Gershoff-Stowe shows that imitating and responding to someone’s gestural productions and idiosyncratic movements is likely to increase both the number of different gestures a person uses and the frequency of gesture use.³¹
- Providing enhanced gestural input. This means that clinicians and caregivers use ordinary gestures and add other gestures when interacting with the augmented communicator. Additional gestures used for input include those that are specifically adapted from action schemes, invented by the individual or borrowed from sign language.¹⁴

Intake

To increase an individual’s ability to understand available communication forms, including gestures, a speech-language pathologist may work toward increasing comprehension of gestures and other communication modes. Examples are:

- Being responsive. People tend to learn the gestures that other people respond to. Research suggests that children who use

frequent, clear communication have mothers who respond to their communication behaviors as meaningful and try to negotiate the meaning of unintelligible communication behaviors.^{2,31}

- Labeling the person’s gestural behaviors using spoken language. Higher rates of facilitative input (verbal models of nonverbal behaviors) may help the augmented communicator understand the meaning and value of gestures and may result in higher rates of gestural communication.³¹
- Increasing the person’s repertoire of re-enactment gestures. Gestures that consist of repeating an action from an event to make it reoccur are known as enactive-indexical gestures. They show a person has communicative intent, even when they have a limited symbolic means to express that intent.¹¹ By increasing the use of re-enactment gestures, partners may facilitate symbolic development.
- Research demonstrates that when caregivers present messages by saying with words and showing with gestures, children better comprehend the spoken input.³²

Output

Encouraging people to use symbolic gesturing not only increases the number of gestures in their repertoire, but also increases the frequency of gestural communication and may even facilitate cognitive and spoken language development. AAC professionals can encourage output by:

- Increasing the intelligibility, readability and predictable use of the person’s gestures.

- Encouraging the use of gestures in conjunction with other AAC techniques and natural speech. Best practice in AAC supports the use of multi-modalities.
- Teaching augmented communicators how to use gestures and graphic symbols. When gestures are produced in conjunction with graphic symbols, meaning may be more easily understood than simply touching or pointing to a graphic symbol.²⁹ AAC users can use gestures that are redundant in meaning to clarify messages, for emphasis or to supplement graphic symbols on a low-tech display or a voice output device.
- Encouraging individuals to communicate using their bodies. Research suggests gestures may serve as a scaffold to the development of conventional symbol learning and use.^{1,11}
- Providing prompts during interaction to encourage gestural use. Prompting strategies include movement cues,³³ waiting and providing meaningful consequences when a specific gesture is produced.²⁹
- Teaching gestures with unique combinations of motor actions that are distinct from one another (*i.e.*, differ widely in handshape, arm movement, location).²⁹ For example, gestures for ‘eat’ and ‘drink’ are likely to be similar, thus clinicians would not teach these gestures at the same time, especially to people with impaired motor skills and to those who are in the early stages of communication development.
- Providing opportunities to engage in gestural imitation tasks. For example, when a child imitates movements, the adult

and child share an experience and an understanding. Gestural imitations can be taught in the context of songs, games and repetitive action routines.

- Creating opportunities to use gestures during daily communication exchanges. Gestures provide a means to engage in functional communication exchanges and lay the foundation for communication using non-speech symbols and signals. Creating ritualized routines that include the use of gestures may help develop larger gestural repertoires.

Uptake

A major purpose of the field is to increase the intelligibility of an augmented communicator’s communication attempts. AAC professionals can increase the uptake of gestures by:

- Helping people identify idiosyncratic gestures. Responsive communication partners notice movements that are entirely missed by the general public, or even those who know the person but are not as “tuned in.” AAC clinicians and teachers who are focused on teaching someone to use AAC may inadvertently disregard the person’s meaningful use of gestures.
- Videotaping the person during interactions with primary partners. Sometimes it is easier to see gestures as a component of an overall AAC intervention after watching a videotape. Videos can help primary partners and service providers reach consensus about the importance of their own input, as well as their ability to


Continued on page 12

Intervention, Continued from page 11

understand and respond to the communication gestures of an augmented communicator.

- When necessary, replacing idiosyncratic gestures. While it is critical to understand the intended meaning of an individual's idiosyncratic gestures, clinicians may need to reshape these behaviors to be more conventional or more socially acceptable. Guidelines for replacing existing behaviors include: (1) make sure the new form has the same communicative function as the original behavior and (2) make sure the new communication behavior is more efficient than the original behavior with regard to ease of production and readability by partners.²⁹

Summary

Gestures are an important form of communication output for everyone who relies on AAC, regardless of age, motor ability, or developmental level. They convey information and regulate interaction and are always available. Even the most physically involved augmented communicators use gestures, including pointing and head shakes in conjunction with graphic symbols and AAC devices. Yet gestures are rarely highlighted in our training protocols or mentioned in our literature. This section provided some ideas that may help clinicians, teachers and family members to support the use of gestures as one component of an individual's multi-modal communication system. 

On the Web



http://www.ccp.uchicago.edu/faculty/David_Mcneill

David McNeill is a leading researcher in gesture at the University of Chicago. His website

describes research that involves the gesture-language interface. It lists relevant publications and presentations.

Websites on gestures

http://allsands.com/Kids/Education/babysignlangua_rql_gn.htm

This webpage describes the popular phenomenon of "Baby Signing" from the perspective of a mother with a hearing impairment. She describes her positive experience with her son using this approach.

<http://www.babysigns.com/>

Researchers Linda Acredolo and Susan Goodwyn describe their approach of encouraging symbolic gesturing in young children. The site highlights their popular book, *Baby Signs*. You can download pictures of children using gestures.

<http://www.sigmaxi.org/Amsci/articles/99articles/corballis.html>

A lengthy article describing the role of gesture in the evolution of language. It integrates information from diverse research areas: the neurology of language, the sophistication and cross-cultural nature of sign languages and the ability of apes to communicate with signs. It links to other websites.

http://www.ccp.uchicago.edu/faculty/Susan_Goldin-Meadow/

Susan Goldin-Meadow's research examines non verbal communication, specifically gestures. The site summarizes current and past research and provides links to descriptions of current research, publications and other useful gestural research sites.

<http://more.abcnews.go.com/sections/living/null/deafkids0115.html>

How Deaf Kids Learn to 'Talk' - It's in the Hands. This ABC News webpage is fun and easy to understand. It summarizes research on how deaf children gesture and sign and has links to video footage from studies conducted at the University of Chicago.

<http://zen.sunderland.ac.uk/%7Ehb5jma/1stbersn.htm>

This site links to a number of different sites on nonverbal communication, nonverbal behaviour, gesture, posture, and related areas. It is useful for researchers and others. Note: Some of the links do not work.

HOT off the press!

Beneath the Surface: Creative Expressions of Augmented Communicators

Edited by ACI's Michael B. Williams & Carole Krezman

This anthology contains the creative works of 51 augmented communicators from 12 countries. Through art, poetry and prose, the authors, and artists express their views and dreams of love, life, war and everyday experiences. Useful to clinicians, educators, manufacturers and their representatives, augmented communicators and their family and friends. It demonstrates the positive outcomes of the field and will make a thoughtful gift.

\$23 US (\$18 for members of ISAAC) plus postage and handling charge. Multiple copy rates are available. Contact: ISAAC, 49 The Donway West, Suite 308. Toronto, ON M6C 3M9 Canada. 416-385-0351 (phone); 416-385-0352 (FAX); secretariat@isaac-online.org; www.isaac-online.org

The AAC-RERC



Year 2 Update

As Year two of the AAC-RERC project nears an end, researchers and developers at lead institutions are reporting exciting progress. This issue updates the progress of the AAC Rehabilitation Engineering Research “Center.” Check out their website at www.aac-rerc.com to stay up-to-date.

Research Projects

Attitudes of AAC Users, Peers, and Intervention Professionals toward AAC Technology and its Use by Elderly Persons

Lead institution: University of Nebraska, Lincoln, Principal investigator: Dr. David Beukelman

Purpose: To investigate the attitudinal barriers of elderly persons with different types of severe communication disorders and their communication partners toward AAC technology and to document any differences in these attitudes for people whose communication disorders are secondary to stroke, amyotrophic lateral sclerosis (ALS) and Parkinson’s disease.

Progress. Researchers have completed a project that compared the attitudes of AAC users with ALS, their family members or caregivers, and peers toward the communication that is produced using speech that is impaired (dysarthric), low-tech communication books, and high-tech AAC devices. In general, all groups preferred high-tech AAC devices over both low-tech options and dysarthric speech. They also preferred low-tech options over dysarthric speech. Overall, the attitudes of AAC users with ALS, their spouses or caregivers, and their peers were similar.

In a second project, researchers compared the attitudes toward a storytelling task among AAC users with ALS, their spouses/caregivers and peers. The stories were presented under three conditions: (1) word-by-word, (2) sentence-by-sentence and (3) entire

narrative. Stories were presented using an AAC device with EZ Key software (Words +, Inc.). All participants responded similarly. The full narrative presentation

was preferred over the sentence-by-sentence and word-by-word presentation modes. Sentence-by-sentence presentation was preferred over the word-by-word presentation mode.

A third project compared the preferences of caregivers/family members, speech-language pathologists and peers for storytelling. The storyteller was a man with moderate aphasia using (1) natural speech, (2) a low technology notebook, and (3) an AAC device with digitized speech output. Results show that caregivers/family members, speech-language pathologists and peers responded differently. Family members and speech language pathologists preferred natural speech over either the low-tech or high-tech options. Peers preferred the digitized speech mode over the natural speech and low-tech communication book option.

Underway is a fourth project that compares storytelling by persons with mild, moderate, and severe aphasia using natural speech, a low tech communication book, or a digitized AAC device. Participants in this study are persons with aphasia and their peers.

The Study of Organizational Strategies for Adult AAC Users

University of Nebraska, Lincoln, Dr. David Beukelman

Purpose: 1) To determine the organizational capabilities/preferences of three groups of adult AAC users with acquired impairments and a group of adults without disability; 2) to compare the similarities and differences in organizational preference among these groups and 3) to determine if organizational capabilities/preferences on non-AAC tasks is predictive of performance during communicative interchanges using AAC systems.

Progress: In the first project, participants engage in confrontational message storage and retrieval tasks using experimenter determined and self-determined organizational strategies. The second project examines the relationship between communicative performance in context and

organization capabilities/preferences of persons using dynamic display AAC systems organized according to the strategies studied in the first project. A computer-based interface, developed for the project, utilizes a dynamic screen strategy and allows for the presentation of orthographic and iconic information using various organization strategies. Currently, 15 elderly adults (over 70 years of age) without disabilities have participated. Their accuracy, rate and preference for three different organizational strategies (semantic, location and theme) will be compared to other groups. Researchers are currently investigating the performance of people with traumatic brain injuries (TBI) using the research protocol.

Improving AAC Technologies for Young Children with Significant Communication Disorders

Pennsylvania State University, Dr. Janice Light

Purpose: To evaluate the learning demands of different approaches to language representation, presentation, organization, and/or selection in AAC technologies for toddlers and young children; and determine empirically based, developmentally sound design specifications for improved AAC technologies and instructional protocols for young children with significant communication disabilities.

Progress: The project involves two distinct phases. The first phase addresses how to organize and present language concepts in AAC technologies to minimize the learning demands and maximize communication power for young children. A major research study was undertaken to investigate the learning curves and functional performance of typically developing children ages 2, 3, 4 and 5, using different assistive technologies. Results suggest that young children without disabilities have difficulty learning to use AAC devices as they are currently designed. These findings have obvious implications for children who rely on AAC. For more specifics, see the previous issue of ACN (volume 12, #6) which focuses on the use of AAC in early childhood.

The second phase of the project will consider how to design selection techniques for AAC technologies to minimize the learning demands and maximize accuracy and efficiency for

Continued on page 14

AAC-RERC, Continued from page 13

young children. Initial planning for that project is underway.

Evaluating and Enhancing Communication Rate, Efficiency and Effectiveness

University of New York at Buffalo, Dr. Jeff Higginbotham

Purpose: To study factors related to the communication rate of current AAC technologies and its impact on communicative effectiveness.

Progress: The Communication and Assistive Device Laboratory is engaged in three interrelated areas of research and development.

Technology Development. In collaboration with Enkidu Research, Inc., researchers are developing a suite of software tools to document and analyze communication performance. The specifications for a format for communication device logfiles are complete. The beta version of an analysis program to analyze logfile data is complete. An AAC device simulator to facilitate communication performance research is due in the Fall 2000. Work on software to facilitate transcription, coding and analysis of interactive communication is in progress. A hand-held computer system to facilitate direct observation of communication is in the planning phase.

Communication Rate Research. To develop technologies that will overcome the current communication rate restrictions of AAC devices, it is necessary to specify what restrictions currently exist and what speeds augmented speakers need to achieve to sustain non-problematic social interactions. Researchers are developing transcription techniques to analyze interactive communication rates, including a propositional analysis protocol (in progress). They currently are running subjects to determine the effect of communication rate on listener comprehension of synthetic speech discourse. They are analyzing the data they collected regarding the production and error rates involved with learning to use four different scanning techniques.

Communication Performance Assessment Information Dissemination. With input from other AAC-RERC partners, researchers are developing a website that links to the AAC-RERC website and

offers a variety of resources dealing with communication performance assessment in AAC. Included are:

- Ethical issues related to assessment and automated data logging (e.g., surveillance & privacy, legal implications).
- Resources to facilitate the observation and analysis of AAC device and interactive communication.
- Information about RERC research on communication performance.

Improving Employment Outcomes for Individuals who require AAC

Pennsylvania State University, Dr. David McNaughton

Purpose: To acquire detailed information on existing barriers to employment faced by individuals who require AAC and to identify strategies to overcome those barriers.

Progress: Two major studies are underway.

The Employment and ALS project. Researchers conducted a 6-week long focus group discussion on the World Wide Web (WWW) to investigate the employment experiences of five augmented communications with ALS. A moderator presented specific questions designed to gather information about the benefits and reasons for continuing employment, the negative impacts of employment, the barriers to continued employment, the necessary supports required for successful employment and specific strategies and recommendations that may overcome barriers to employment. Key factors to the participants' ability to continue employment were: (1) the nature of employment activities, (2) availability of supports for employment activities and (3) access to appropriate communication systems. Other important factors were the participants' personal incentives for overcoming barriers to employment and their self-determination.

The Employment and Cerebral Palsy (CP) project. Researchers recently completed a focus group discussion on the WWW to investigate the employment experiences of 24 individuals with CP who require AAC. Participants included individuals in full-time positions in community-based employment, as well as individuals who work part-time, work for a company from their home or are self-employed. The focus group discussions took place over approximately eight weeks. Factors considered important to obtaining and maintaining employment were: (1)

appropriate training and experience, (2) the support of friends and family members and (3) effective and efficient AAC technology. Factors cited as significant barriers to employment included: (1) employer attitudes, (2) lack of appropriate educational experiences and (3) difficulty in obtaining effective and efficient AAC systems. Participants specifically described ways AAC technology could better meet the demands of the workplace. They said they needed technology that was faster, more reliable and easier to learn. Researchers will soon be peaking with employers of AAC users, vocational rehabilitation counselors and parents/family members.

In Phase 2 (December 2000) researchers will communicate with AAC users who are seeking employment, and assist them in finding important information resources related to employment.

Advanced ACETS (Augmentative Communication & Employment Technology Supports)

Temple University, Dr. Diane Bryen

Purpose: To increase employment opportunities for selected graduates of ACES and other individuals who use augmented communication by developing, implementing, evaluating, replicating, and disseminating the results of Advanced ACETS.

Progress: Participants in ACETS 99 are currently involved in follow up activities. Bi-weekly contact occurs with each member face-to-face, by phone or email. Monthly timesheets track their progress. A full-day technical workshop in March on webpage development resulted in five of the six participants putting up a webpage that includes their resume. One participant has a part time job in a bookstore. Recruitment is underway for ACETS 2000, scheduled for October 21-29, 2000.

For additional information, contact Kevin Caves, AAC-RERC, Box 3888, Duke University Medical Center, Durham, NC 27710. 919-681-9983 (voice); FAX: 919-681-9984; www.aac-rerc.com

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Continued on page 16



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