

Augmentative Communication News

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INSIDE

THIS ISSUE . . .

Clinical News	Supporting output and uptake
Signals & Symbols	Graphic, vocal and gestural modes
Play	Nonlinguistic mode & intervention context
Speech Output	Synthesized & digitized modes
University & Research	

UPFRONT

This issue focuses on *output* (the quantity and quality of communication a child produces in natural contexts) and *uptake* (the extent to which language forms, in concert with other modes of communication, are understood by a child's caregivers and other communication partners). Our last issue focused on language input and intake. These transactional processes are intricately and intrinsically related, even at a prelinguistic level. Catherine Snow, a highly respected child language researcher, likens normal language acquisition to a rope consisting of several strands. She

says that, while growth of the strands is independent, the rope can not be adequately woven until all strands are present. Prelinguistic strands consist of:

- an understanding that communication is a way to share information
- an intent to communicate
- the capacity to develop context-free concepts
- an understanding (in general) of the nature of symbols
- knowledge that symbols can label objects and conditions
- an ability to control the speech production system in order to produce understandable sounds and words²

As children develop, linguistic strands are added, which gradually strengthen (continued on page 2)



Clinical News

Supporting output and uptake

I asked those interviewed what we should be doing to support (1) the *output* of very young children who are at risk for developing speech and (2) the *uptake* of their communication partners. These researchers and master clinicians agreed there are no easy answers. A major theme for young children (and children who are at early developmental stages) should be facilitating the transitions from their prelinguistic to symbolic to linguistic communication. We should be asking how AAC techniques are supporting the language learning process, NOT the other way around.

Respondents also encouraged clinicians not to neglect using augmentative rather than alternative systems with very young children. Years ago, AAC was introduced as a response to the "speech or else" approach that prevailed within the profession of speech-language pathology. Today, the pendulum has swung in the other direction. We need to remind clinicians that natural speech is an important component of AAC and an ongoing concern of caregivers. Other suggestions were:

Allow yourself to be child-directed. Child-directed approaches foster joint attention by following the child's interest in activities/things. Key features are the use of familiar routines, natural settings, play activities and primary partners. (continued on page 2) **TC**



UPFRONT (continued from page 1)

the rope. These include vocabulary, morphology, syntax, meta-linguistic awareness, pragmatics, graphics, reading, writing and so on. Hunt Berg pointed out that Snow's rope analogy seems particularly relevant to a discussion of the output modes used by individuals who do not have the ability to produce understandable speech. While a lack of speech does not necessarily mean language

is delayed, many children who use augmentative communication (AAC) also experience significant delays in other strands. Also, "when some strands are extremely underdeveloped, even when the rest of the rope seems to be coming together, the result may not be normal language acquisition as we know it."³ Initially, AAC developed out of the need to help people compensate for an underdeveloped or missing strand, i.e., speech production. Since then, we've seen that AAC techniques, devices and strategies can enhance multiple strands. Our challenge lies in finding strategies that support the use of gestural, graphic and vocal modes in ways that provide sufficient efficiency and readability to communicative partners. By so doing, we can enable natural environments to become the nurturing contexts that support the growth of language and communication.⁴

In this issue, **Clinical News** shares thoughts and recommendations from master clinicians and researchers about *output* and *uptake* issues in AAC. **Signals & Symbols** highlights modes of expression that are involved in the transition from prelinguistic to linguistic forms of output. The section on **Play** highlights the transition to symbolic behaviors in a nonlinguistic mode and discusses play as an intervention context. **University & Research** summarizes a project that is providing information about the development of communication and language in young children who are nonspeaking. **Speech output** briefly considers why access to AAC devices may be so important. Many thanks to those listed in **Resources** and **References** for their thoughtful reflections and willingness to discuss their opinions and work.

You may have noticed that in the last issue of ACN the printer inadvertently left off the date (January/February, 1997) and the volume number (volume 10, #1). We apologize for the confusion and inconvenience. No doubt you have also noticed that I am way behind in writing the 1997 volume of ACN. There is a litany of reasons. I apologize, am desperately trying to catch-up and truly appreciate your patience.

Sarah W. Blackstone, Ph.D., Author

Clinical News (cont. from page 1)

Some questioned whether AAC practices today are child-directed enough. They said assistive technology, graphic symbols, vocabulary selection and therapy aimed at requesting and choice-making behaviors often reflect an adult-directed,

tool-oriented approach to intervention.

Milieu teaching and pre-linguistic milieu teaching⁶ are well documented interventions that take a child-directed, transactional approach to the development of communication skills in very young children and those with

developmental disabilities. Please check them out! In the meantime, here are ten ways for professionals to be more child-directed:

- 1. Work within a family-centered model to address a child's needs in transactional contexts.
- 2. Observe and try to understand a child's preferences for people, objects, activities.
- 3. Arrange the environment to increase a child's opportunities for communication.
- 4. Find ways to embed instruction during interaction.
- 5. Expose a child to a variety of AAC strategies and tools but avoid becoming distracted by technology.
- 6. Value the communication modalities a child prefers. Build toward modes caregivers can easily recognize.
- 7. Foster a child's independence and control.
- 8. Help caregivers become aware of a child's unique learning style.
- 9. Support primary caregivers in ways that enable them to encourage their child's interests, learning and interaction skills.
- 10. Teach communication partners to use the child's AAC techniques and strategies whenever and wherever it makes sense to do so.

Appreciate the diversity of the populations we serve. AAC professionals need to consider the similarities and differences in children who use AAC and the partners who are having an impact on their language learning process. Research indicates that the frequency with which children intentionally communicate predicts their language development. Rates of communication acts need to approach one per minute to make the transition from prelinguistic to initial symbolic communication.⁷ Some children who use AAC have low communication rates. Many have partners who do not recognize their gestures, vocalizations, manual signs and graphic symbols. Lots of factors influence uptake:

Cultural differences, economic factors, social factors, personality, attention deficits, and learning disabilities.

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titles, education level, familiarity with differences, acceptance of differences, ability to adapt to difference, vision, age, stress level, attention span, literacy, a belief the speaker is communicating, and so on.^{8,9}

While no one has studied or described the diversity inherent in the partners of AAC users, Martinsen and von Tetzchner have made an effort to describe characteristics of three groups of children who benefit from AAC.¹⁰

- Expressive language group. These children have severe motor problems that interfere with their production of speech. They may also have difficulty with other forms of expression (*i.e.*, gestures, access to symbols/devices, manual signs). Children in this group display a large gap between comprehension of spoken language and their speech capabilities, which persists across their life span. They use a variety of output modes, primarily linguistic, to deal with their extensive communication needs and the uptake requirements of multiple communication partners and contexts.
- Supportive language group. Many children who benefit from AAC seem to fall in this group. Included are those with severe articulation disorders, Down syndrome, language impairment, dyspraxia, cognitive delays and behavioral difficulties. Some of these children develop functional speech later in life, at least with familiar partners. When they are young, however, many use manual signs and gestures, which they can produce independently and which familiar partners understand. As they grow up, most also rely on graphic symbols and speech output devices in order to expand the number of people with whom they can interact.
- Alternative language group. These children, whose diagnoses include autism and severe mental retardation, have little or no speech. They have severe difficulties comprehending, as well as expressing spoken language. For them, AAC techniques augment both comprehension and expression. Many seem to prefer using gesture and graphic

modes. These children often are described as having low rates (less than 1 per minute) of communication. Also, partners (a) have problems with uptake, (b) may ignore idiosyncratic signals or (c) may inadvertently reinforce maladaptive behaviors. These factors place these children at greater risk for language development problems and behavioral difficulties.

Make AAC output and uptake as easy as possible. A major purpose of AAC is to make language output (and uptake) as accessible as possible to AAC users and their partners. Young children who rely on AAC face a difficult task. They must select a communicative signal and a means of expressing that symbol that are efficient for both the child and listener.¹¹ Output needs to be understandable. Back in the early 1980s, I recall recommending synthesized speech devices that were almost as unintelligible to partners as the dysarthric speech they were intended to replace. Fortunately, today's equipment is easier to use and to understand.

Interviewees stressed that we need to recommend AAC techniques and devices that: (1) are immediately relevant to the child's current language and communication levels (as well as build toward the future), and (2) are integrated into the life of the child and family, not the other way around.

Do not underestimate the potential of any child. Valuable intervention time and resources can be wasted when clinicians do not know what a child knows or doesn't know and needs to learn. However, unless and until a child has a reliable means of expression, we can not find out. Several interviewed felt it was important for AAC professionals to use an interactive and dynamic model of assessment.¹²

Use scaffolding to promote success. From birth, it is important that caregivers interpret a child's signals and respond in ways that announce to the child that his or her output is meaningful, understood and valued. Scaffolding is a "constructivist" strategy used to support learning.¹³ Partners of AAC users often play a dual role: conversational partner and help/scaffolder.¹⁴

Begin what is difficult where it is easy. Experts concur that AAC intervention with young children should begin with behaviors that children already have under productive control. This means expanding the use of gestures and vocalizations and then building from there. Specific comments were that AAC professionals:

- should be learning which expressive modalities a child uses to signal and symbolize and how a child currently requests, refuses, illustrates and comments;
- should be expanding world knowledge, encouraging conventional object use, facilitating routines and symbolic play as well as increasing the child's success in interaction;
- need to support and develop children's ability to control and feel connected;
- worry too much and too early about AAC symbols and devices. People are a child's first tool.

Summary

When output and uptake are the focus of AAC intervention, experts suggest we remember that AAC is not just about techniques and technology. AAC is really about language and communication. Until we can provide children with the means to produce language independently, in ways that others can understand, we shall fail to realize the promise of AAC and fall short of meeting the challenges we embarked upon several decades ago.

Signals & symbols

Graphic, vocal and gestural modes

Symbols depict; signals alert. Both are important to our discussion of the *output* of young AAC users and the *uptake* of their partners.

Signals are spontaneous forms of expression which typically involve vocalizations and body gestures. Objects and graphics also can be signals (e.g., handing someone an empty cup). Signals are nonlinguistic and nonsymbolic ways to communicate specific information. Children use signals, often with intent, to greet; protest; express preferences, needs, feelings; make comments and choices and so on.

Signals underlie communication success throughout life. However, they are limited in both the amount and type of information they can convey. They are tied to the here and now. They can be ambiguous or idiosyncratic, especially when produced by someone who is very young or who has motor and/or cognitive impairments. To interpret signals as meaningful communication acts, caregivers rely on contextual cues. For example, when a child opens and closes her hand, it could be a signal for "bye bye," "gimme," or "I'm excited." Signals provide building blocks for the symbolic and linguistic behaviors that follow. Table I is an example of a signal inventory for a young child with severe physical impairments. An inventory like this can help caregivers recognize and reinforce signaling behaviors. 15

Symbols depict meaning. They are context free, conventionalized in language and have specificity. Symbols may be linguistic (spoken language, writing, sign language, graphic systems) and nonlinguistic (pictures, art, music, dance, mime). Much of our focus in AAC has been geared toward helping children use symbols to express language. Thus the emergence of symbols is very important, because it means a young child may be ready to use linguistic forms of expression. Linguistic symbols allow for efficient communication to occur.

Table I. Signal Inventory (~,dal)tt'dfrom U1a('kstollt'& nllllt nt'r~, 1991)15

SIGNAL	WHAT IT MEANS	WHAT TO DO/SAY
Vocalizes	I want something/your attention.	Acknowledge the initiation and respond. Try to figure out reason.
Looks away when calling or talking to him.	I'm ignoring you (if he's smiling, it's a game).	Acknowledge. If it's not time to play, tell him he needs to look and wait.
Looks away when something is going on	I'm focusing with my ears.	Let him enjoy attending with his ears. If it's important he look, tell him.
Hits, switch-says "I want more"	Please, do that again.	Repeat the activity.

From signals to symbols

The transition from signaling to symbolic behavior occurs across modalities: vocalizations to speech, gestures to manual signs and graphics to aided language. Available literature suggests that taking advantage of all modes concurrently represents best practice, although it is not clear how one mode influences the acquisition of another.¹⁶ While typically developing children make transitions from signals to symbols to linguistic modes relatively rapidly, children with severe communication impairments often rely on signals for extended periods of time. Some children do not appear to make these transitions because they do not have access to the linguistic forms they need. The extent to which children who use AAC techniques produce output that reflects their level of understanding depends partly on: (a) the quality of the input they receive, (b) characteristics of the output modes they are using and (c) the child's own capacity to understand and use language.

Vocalizations/speech. In most cultures, parents treat early vocal behaviors as communicative. Later, they expect children to speak. Parents of preschoolers who use AAC often worry about the impact of AAC techniques on speech. Some feel that professionals even ignore vocal modes. Those interviewed suggested that we remember that:

D When we introduce AAC, many perceive that it means professionals have given up on speech.

D If we fail to give a child's vocal behaviors importance, we are letting down the child and his caregivers. Any speech is better than none.

Children who use AAC and make sounds (whether they are 12 months or 12 years old) may indeed be signaling their partners. They are also "practicing" the skills they need to produce intelligible speech. Research demonstrates that the quantity of vocalizations and the consonants a child produces are predictive of speech development.¹⁸ Early on, we can not predict if and when intelligible speech will emerge. However, if vocalizations within a child's repertoire continue to be encouraged, the impact on speech development is likely to be positive. An AAC professional recounts:

I have maintained contact with a few children that I worked with earlier in my career. They are now adults. One who was a preschooler when we started remembers the frustration of not having a way to communicate specific information in a formal manner. He also remembers the joy of finally having access to graphic symbols. However, he now says that the greatest joy of all was when he finally was able to speak well enough so at least some people could understand what he said. 19

Even if speech never develops, vocalizations continue to be important signals and are often crucial to communication success. Vocalizations can also augment AAC techniques by adding emphasis, tone and personality to communication. To facilitate development, AAC professionals may

- introduce strategies that increase a child's play with sound and attempts at speech.
- find ways to make speech output devices become facilitative (e.g., songs, non-speech sounds, babbling).
- do verbal activities that are not speech therapy drills.
- give specific training in using vocal behaviors to establish joint attention.

Gestures/manual signs. Gestures include pointing, eye gaze, body movements, postures, and facial expressions. Several suggested:

When AAC professionals fail to focus specifically on the development and maintenance of gestures we inadvertently devalue them for the family. (See Resources section).

During the prelinguistic and one word stage of development, children typically use gestures in about 75 percent of their communication acts (about half of these are accompanied by vocalizations).²⁰ Family members interpret gestures as meaningful and may find them easier to understand than more formal types of AAC strategies. Most children, including those who have limited and idiosyncratic repertoires because of severe motor or cognitive impairments, produce gestural signals that are understood and valued by their partners.

In *Baby Signs*, Acedolo and Goodwyn encourage parents to teach gestures/signs to normally developing infants beginning in their first year!²¹ Why not, they argued, provide infants with the assistance they need to use language before they can control their speech production system? Their research supports using AAC modes as early as possible with children who have delayed speech. They found that:

- Normal infants have early constraints on spoken language production and can benefit from training in sign language of one kind or another.
- Infants are capable of using gestures as symbols providing they are in their motor repertoire and easily organized into a repeatable unit.
- Parents are able to teach their infants idiosyncratic symbolic gestures.
- Gesturing is related in a positive way to verbal language development.

- Infants do not become dependent upon gesturing.
- Infants who use "baby signs" display striking individual differences in their patterns of verbal language and sign language development. Some children show an apparent interest and skill in the articulatory/phonological domain. Others show the reverse.

AAC users are generally not dependent on the quantity or quality of signed input because they understand spoken language. Even so, research on language learning in deaf children is relevant.

Deaf children with deaf parents who use sign language, learn language at a rapid rate and in a manner remarkably similar to hearing children of hearing parents. This is not the case for deaf children of hearing parents who are not adept at sign language. Their receptive and expressive language development is significantly delayed. They receive less exposure to the language forms they can use.²²

Signed input to children who hear and can not speak generally occurs intermittently and is described as restricted in vocabulary, lacking in morphology and atypical in syntax. Not surprisingly, the output of AAC users who rely on gestural modes reflects this input. Children who rely on gestural modes also face problems with uptake. Few people understand sign language. Even those who do may have difficulty interpreting the signs of children with developmental delays. However, when children show clear preferences for gestural modes, AAC professionals should support their preferences and encourage partners to do likewise.

Graphics/aided language. By two years of age, graphic symbols represent a supplement to speech and have a primary role in literacy activities of typical children. The process of learning to understand and use graphic modes as signals, symbols and linguistic forms is not well understood.²³ There is evidence, however, that as with vocal and gestural modes, understanding and using graphic

modes, is an age-linked, maturational process which depends, to some extent, upon a child's experience.²⁴

When a child points to a graphic, it does not necessarily mean he/she is demonstrating symbolic behavior. For example:

- In the PEC (Picture Exchange Communication),²⁵ a child is taught to hand a caregiver a card with a graphic symbol on it, e.g., cracker. Initially, it is not important that the child attach meaning to the picture or use it as a true symbol. Partners know the child; and the context makes the meaning clear. In effect, the child is using a graphic symbol as a signal.
- A similar situation may occur when a child hits a switch to activate a speech output device. If the child doesn't understand the symbol on the switch or the pre-programmed phrase, "I want a cookie please," communication still can occur because partners are able to interpret the output as though the child had constructed the sentence, i.e., spoken language is used as a signal.

Graphic modes have some specific advantages and disadvantages that require investigation:

Advantages: Graphic modes: (a) are static, (b) seem to require recognition, not recall memory, (c) may serve as both input and output, (d) provide access to speech output, (e) can be understood by multiple partners.

Disadvantages: Graphic modes: (a) make it difficult to establish joint attention, (b) make it difficult to access large vocabularies, (c) limit access to morphologic or syntactic forms, (d) create barriers to active participation because of slower rates, (e) alter interactive patterns.

Summary

Deciding the relative emphasis to place on graphic, gestural and vocal/speech output modes has received relatively limited attention. However, most practitioners and researchers seem in agreement that coordinating these modes represents the most plausible strategy to create an efficient AAC system?



Play

Nonlinguistic mode & intervention context

*I tried to teach my child with books. He gave me only puzzled looks. I tried to teach my child with words. They passed by him, oft unheard. Despairingly, I turned aside. "How shall I teach this child?" I cried. Into my hands he put the key. "Come," he said, "Play with me."*¹⁷

Play is not only an activity; it is a form of expression and a means of acquiring knowledge.²⁸ Play is a child's work.²⁹ In their definition of play, Lifter and Bloom write:

"Play is the expression of intentional states—the representations in consciousness constructed from what young children know about and are learning from ongoing events—and consists of spontaneous, naturally occurring activities with objects that engage attention and interest. Play may or may not involve caregivers or peers, may or may not involve a display of affect and may or may not involve pretense."³⁰

Like gestural, vocal and graphic modes, play behaviors reflect the transition from the presymbolic to the symbolic. Thus, play can be a key assessment context in AAC. During play activities children reveal their understanding of the world, preferences, interests, symbolic abilities and anxieties. Adults learn valuable information from observing a child engaged in self-initiated play activities:

- Early stages of play are characterized by exploration of self and the environment. We interpret early

play as signals of curiosity, engagement with people and interest in things. The child may bang, pick up, drop, and mouth objects, and may squeal in response to interactive games (peek-a-boo).

- As world knowledge and experience increase, children begin to use objects in functional or conventional ways. The child's use of objects appropriately signals an emerging representational capacity.
- A child may do simple "pretend" play and brush his hair or drink from a cup. By observing, we can tell if a child understands the concepts of "brush," "cup" and so on. Initially these actions are directed toward the self and later toward others. Children may also begin to label some of these objects. In a recent article, Casby states that when children begin to "pretend" and use objects functionally, they are signaling the emergence of social behavior (not symbolic behavior). This alerts caregivers that a child is interested in and beginning to understand social conventions.³¹
- Symbolic play requires that a child use objects to represent actions, objects, and agents in a decontextualized and decentered manner. For example, when a child picks up a block and uses it to pretend to give a doll a drink, the child is (a) relating two objects in a meaningful way, (b) representing a daily event using toy objects, (c) using one object to stand for another (a block to represent a cup) and (d) treating inanimate objects as though they were alive (e.g., stuffed animals, dolls). Over time, children enact more complex routines in their symbolic play, e.g., a visit to the doctor. These behaviors

generally correlate with the rapid expansion of language and emergence of multi-term utterances.

- Dramatic and socio-dramatic play becomes even more dependent upon language. Children plan elaborate enactments of real and imagined events. They assign roles. [I'm the teacher. You be the new girl in the class. I'll teach you to read.] Literate children may write scripts for backyard theater performances. Symbolic expression at this level includes mime, drama, cartoons, scenery, music, art and elaborate props, as well as language.

Play encourages connectivity among different modes of expression. As an intervention context, it supports expression, learning, communication and peer interaction. Research shows that children with speech and language impairments demonstrate conventional actions with standard/typical objects in their play and engage in object-based symbolic play. However, they do so less frequently than normally developing youngsters.³² To date, we have little research describing the play of children who use AAC. We do know, however, that children without intelligible speech and with limited motoric skills are severely restricted in their play experiences. Intervention resources are available to assist AAC professionals to construct meaningful play activities for young children.

Speech output

Synthesized & digitized modes

Speech output devices, like articulated speech, serve as both input and output, and are, in most cases, the most effective uptake tool we have in AAC. Many interviewed feel that speech output devices can help very young

children learn language. When a child selects a graphic symbol, for example, speech results. The child hears it; the partners hear it. Of course, spoken utterances are more likely to be understood by partners who are less familiar with the child's communicative repertoire.

Those interviewed cited other reasons to support the use of speech output devices with very

young children and called for more research.

- Synthesized speech increases the likelihood that children with severe disabilities learning language will attach meaning to graphic symbols and use them to communicate, because the consistent output signal makes it easier for children to learn than articulated speech.³³
- Speech output makes it easier (perhaps automatic) for children to establish joint attention with partners.

- Speech output become a mode of input for the child. Each time a child selects a graphic symbol, a spoken message is produce immediately.
- Digitized speech enables a child to play with nonspeech sounds (animals, babbling).
- Synthesized speech may support children's development of oral language, graphic and literacy skills.
- Synthesized speech enables a child to play with phonemes, syllables and

words, e.g., segment phonemes [CAT=cat] and/or word order.

- Speech output may supports social/communicative goals.
- Speech output may play a role in allowing children to feel in control of all kinds of situations, as well as their own communicative output.
- Speech output may be motivational because children can generate their own speech model.
- Combining sign and an electronic device may be more effective than

sign alone in eliciting single-word and multi-word combinations³⁴

- Speech output increases the number of people with whom AAC users can interact.

The potential benefits of speech output in the language learning process warrant a more aggressive campaign by professionals to provide AAC devices to children at much younger ages than we typically do now.

University & Research AAC Precursors

Cynthia Cress is conducting a five-year, NIH funded research project entitled *Communicative and Symbolic Precursors of AAC Development*. She is examining the patterns of communication development in young children (ages 1-3 years) with physical impairments. Participating children have severe speech-motor impairments that are associated with a long-term need for AAC. The study provides 18 months of longitudinal observation and trial AAC intervention for 40 children with severe physical disabilities. Children with primary autism, sensory or cognitive disabilities (such as Down syndrome) are excluded, although most participating children have multiple disabilities, including some with cognitive and sensory impairments.

One focus of the project is to observe patterns of development for nonspeaking children with physical impairments across a wide range of skill levels. Data collection includes (1) administering a variety of standardized language and developmental measures, (2) doing informal probes and screenings, (3) observing free play and communication during naturalistic interactions with caregivers, (4) monitoring qualitative changes in

communicative signals and strategies and (5) observing the effects of trial AAC intervention strategies customized to children's existing patterns of communication, including:

- training partners to respond to and promote spontaneous communication signals
- developing (behavioral and gestural communication) using adapted play
- supporting emerging literacy skills
- making situational adaptations
- using low-tech strategies and electronic strategies.

Preliminary results suggest that:

1. Standardized tests miss key skill developments in children who are nonspeaking. In fact, a majority of the test items for children 0-2 years of age are not achievable by children without hand or voice control. New norms are being constructed for measures that are achievable by young children who are nonspeaking.

2. Early AAC skill development encompasses abilities that are not usually expected of typically developing children. These include using external tools and augmentative strategies to express messages. Cress has an AAC skills checklist available.

The project also aims to help professionals in planning intervention, by identifying factors that predict successful AAC skill development. For instance:

1. Children with physical impairments do not play the same kinds of imitation games as typically developing children. The project investigates whether skilled AAC communicators actually bypass the need

for imitation as they are learning language skills, or whether imitation should be an early intervention target for children relying on AAC.

2. Considerable evidence suggests that parent responsivity to children's signals is a key factor in early communication development. This project is tracking the effectiveness of strategies designed to increase parent responsiveness.

3. Professionals cannot effectively intervene with all communication skills at the same time. This research attempts to determine which early language/communication skills will predict the greatest degree of change over time for children relying on AAC. Variables being explored include: joint attention, initiation, mastery, imitation and turntaking.

Another focus of the project is to ascertain the extent to which the data collected from these 40 children can be applied to other children who rely on AAC. Internal analysis will determine whether factors observed early in life can predict which children demonstrate a given level of skill development by the end of the project. The goal of this project is to contribute to the knowledge base in AAC, by providing information about the language development process in young children who are nonspeaking. This research may suggest ways professionals can make AAC intervention more meaningful.

For further information, contact Cynthia Cress, University of Nebraska-Lincoln, 202 Barkeley Memorial Center, Lincoln, NE 68583, USA. (402) 472-4431. ccress@aulinfo.unl.edu



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RESOURCES

Mary Hunt Berg, P.O. Box 6849, Moraga, CA 94570. 510-299-8791. huntberg@aol.com

Susan Blockberger, 11780 Yoshida Ct. Richmond, BC V7E 5C6 604-434-4331 sblock@sunny.wimsey.com

Linda Burkhart, 6201 Candle Court, Eldersburg, MD 21784. 410-795-4561. lindaub13@aol.com

Faith Carlson, Rt. 1, Box 2315, Unity, ME 04988. 207-437-2746. fcarlson@unitel.net

Cynthia Cress, University of Nebraska-Lincoln, 202 Berkeley Memorial Center, Lincoln, NE 68583, USA. (402) 472-4431. ccress@aulinfo.unl.edu

Nicola Grove, Psychology and Special Needs, Institute of Education, 25 Woburn Square, London, WC1H 0AA, England. 0181 8833416. n.grove@ioe.ac.uk

Teresa Iacono, Macquarie University, School of English Linguistics and Media, Sydney, NSW 2091, Australia. +612850 8728. tiacono@lavie.ocs.mq.edu.au

Carole Krezman, P.O. Box 10098, Berkeley, CA 94709. 510-649-Q653

Mary Ann Ronski, Dept. of Communication, Georgia State University, Atlanta, GA 30303. USA 404-651-3469. jonmar@gwusgiz.gsu.edu

Martine Smith, School of Clinical Speech and Language Studies, Trinity College, 184 Pearse Street, Dublin 2, Ireland. +353 1 6082027. mmsmith@tcd.ie

Gloria Soto, San Francisco State, 1527 Sacramento St., Berkeley, CA 94702. 415-338-1757. gsolo@sfsu.edu

Ann Sutton, Mackay Centre/McGill University, 3500 Decane Blvd. Montreal, QB H4A 3J5, Canada. (514) 482-0500 x296. asutton@mackayctr.org

Stephen von Tetzchner, Dept. of Psychology, University of Oslo, PO Box 1094, Blindern N-0317 Oslo, Norway. s.v.tetzchner@psykologi.uio.no