

Speech/Phonological Intervention for Young Nonspeaking Children with Limited Sound Inventories

Cynthia J. Cress, Ph.D., University of Nebraska-Lincoln
Presentation at the American Speech-Language-Hearing Association
Conference,
New Orleans, LA, Nov. 16, 2001:

I. Terminology and Background

A. **Augmentative and Alternative Communication (AAC)**: anything that helps children or adults to communicate when traditional strategies are not sufficient to accomplish a communication goal (Cress, working definition)

B. **CAQ**: What skills does a child need before you start addressing AAC & literacy?

- Communication starts with interaction and the earliest behaviors of children - there are no prerequisites. Communication might involve language but can be much simpler also.
- Previous research that attempted to assign prerequisites to AAC were only considering symbolic forms of communication
- Basic AAC intervention includes behaviors, gestures, cooperative actions, and sounds, and does not depend upon controlling complex systems or devices. These early skills do facilitate the gradual development of more complex skills.

See: Kangas, K.A. & Lloyd, L. (1988). Early cognitive skills as prerequisites to augmentative and alternative communication use: What are we waiting for? *Augmentative and Alternative Communication*, 4 (4), 211-221.

C. **CAQ**. Where do you start teaching communication - isn't yes/no the most basic skill?

- Yes/no tends to be a later-developing skill, since those words can have a wide variety of meanings and results.
- Also, yes/no tends to reinforce passive responding rather than active functional communicating.
- Earlier functions may include greetings, protests, requests for attention or objects, more/all done

See: Reichle, J., Halle, J. & Johnson, S. (1993). Developing an initial communicative repertoire: Applications and issues for persons with severe disabilities. In A.P. Kaiser & D.B. Gray (eds.) *Enhancing Children's Communication: Research Foundations for Intervention*. Baltimore: Brookes

D. Rule of Thumb for estimating the relative difficulty of a communication strategy for children

How many "tools" does the child have to actively control to accomplish a communicative function?

- For example, using a single switch that says "more tickle" for requesting uses: Child's behavior + Other person's behavior + Message Content + Language + Symbolic representation + Device
- The first "tool" that a child learns to control is their own body, and operation of any other types of "tools" relies on controlling some type of behavior (including eyegaze, sound, or movement).
- These "tools" are not necessarily physical items, but separate aspects of interaction that we use to accomplish communicative goals. "Other people" tends to be the second "tool" a child uses.
- If a communication task is too difficult for a child, try reducing or scaffolding the number of the above tools that are necessary to accomplish particular communicative goals.

2. Number of communicative tools in request for "tickle" with voice output switch & symbol

Type of Communicative Tool	Example
Child initiates a behavior	Reaches own arm out and controls its movement
+ Toy or other direct object	Pushes switch with arm movement
+ Intent or Content	Child enjoys and wants to continue tickle game
+ Symbolic representation	Chooses picture symbol representing "tickle"
+ External Device	Controls a non-behavioral means of communication
+ Language	Conveys specific semantic content: More tickle
+ Voice Output	Hears "more tickle" from device
+ Affects other person's behavior	Partner attends to and interacts with child
+ Communicative Outcome	Child anticipates/reacts to specific tickle activity

II. Early Vocal Expectations in Prelinguistic Children vs. Nonspeaking Children

A. CAQ. Will my child talk?

- Talking isn't an either/or question, and labeling a child as "nonspeaking" does not indicate that they cannot use speech for any type of communication.
- Children who are having difficulty controlling the muscles involved in the speech/respiratory process, or who have other neurological or cognitive limitations that affect speech and language, are at risk for developing speech that is intelligible to all listeners.
- Children's motor systems are still developing in ways that cannot be predicted, and early intervention is too early to give up on further improvement in speech skills. Almost all children who can produce a voice will use sounds in some ways that are interpretable to listeners.
- When children continue to learn new sounds or new variations on the sounds they are producing, that is a positive sign for their continued vocal development.

See: Bodine, C. & Beukelman, DR (1991). Prediction of future speech performance among potential users of AAC systems: A survey. *AAC*, 7 (1), 100-11.

B. CAQ: Won't the use of AAC interfere with a child's vocal development?

- Children will use the quickest, most effective, and most accessible means available to communicate: Speech beats any other AAC system, if it is available to the child.

- Since AAC includes all communication methods, intervention also addresses improving functional verbal skills
- Available research indicates that AAC facilitates spoken language by increasing interaction, language skills, and/or providing a voice output model for speech

See: Ronski, M.A., Sevcik., R.A., Reumann, R., & Pate, J.L. (1989).

Youngsters with moderate or severe retardation and severe spoken language impairments. I: Extant communication patterns. *Journal of Speech and Hearing Disorders*, 54, 366-373.

C. Canonical babbling & other milestones in "nonspeaking" children

- Other children with developmental disabilities who are late talkers also show that canonical babbling predicts speech development (Yoder, Warren, & McCathren, 1998). Other predictive factors that predicted who would be "functional speakers" one year later include ratio of expressive to receptive vocabulary inventory, and rate of behavior regulation initiation.
- While some of the predictive factors for children with DD/late talkers may also apply to children who are at risk for being nonspeaking, many predictive factors do not apply or can't be measured.
- Children with poor motor control may not play freely with syllables in the same fashion as children with intact motor systems. Some children with severe PI seem to move directly from single syllable sounds to meaningful words without ever passing through a stage of reduplication.

D. Change in vocal skills (esp. to predict long-term speech skills) (From Stoel-Gamr 1998)

Age	Form (Speech)	Function (Communication)	Intervention Ideas (**Cress)
0-2 mo.	Sounds (Phonation)	Reflexive sound making	Tactile response to spontaneous vocalizations
2-3 mo.	Cooing	Reactive sounds, turntaking	Echo child's sounds, gradually try new sounds
4-6 mo.	Simple Babbling	Activity-based sounds	Pair sounds with physical
6-11 mo.	Canonical Babbling	Communicative sounds	Pause in routines and for vocalization
12 mo. +	Jargon	Communication, First Words	Imitate and expand child's word approximations

E. **Intervention Suggestions: Sound/Vocalization Support:** (from Cress & Ball, 1998)

1. Providing enough support to control sounds

- positioning, even swaddle
- breath support (blowing)
- reduce other distractions or discomforts
- Note tongue may lock if body instability; one of strongest muscles

2. Producing sounds more often within activities

- child in motion, esp. sensory integration activities (rolling, etc)
- pair sounds with activity, but low stress on child production at first
- lots of modeling at or just above child's sound ability
- "toothettes" - sponges to brush mouth, gets structures desensitized and moving
- give lots of feedback to child that they used their voice when s
- pontaneous, note
- circumstances (to help repeat)
- give children a variety of ways to participate in activities if they can't get voices
- going right away

3. Increasing variability of children's sounds

initially imitate child's own sounds after they make them,
look for continuation of sound and turntaking by child
gradually introduce variation of sound, often paired with different motion
provide tactile, social cues for sound (phone, microphone/tape, praise
vocalizing) include activities where sounds are a natural part (songs,
books with repeated lines, rhymes)

F. Phonology – use and processing of sounds (esp. for reading)

1. **CAQ.** How can you work on emergent literacy for children who won't attend to books or any type of printed material, and won't sit still for stories?

- Infants can recognize the difference between distinct sounds such as /b/ and /p/ very early.
- Learning to distinguish the important sounds for your language and how they can be combined is learned through experience and practice
- Being able to separate, relate, and recombine sounds is one of the more important skills in learning to read, and is critical for decoding and spelling new words
- We can work on sounds in ways that don't depend upon children's understanding of the words represented by those sounds:
- Before children learn to read it is helpful if children have experience in recognizing, discriminating, associating, combining, and representing sounds

2. **CAQ:** How can you work on phonological development with a child who is nonspeaking?

- Children do not necessarily need to produce sounds to understand the systems of phonology and sound combinations. (Magnuson, 1996 - ISAAC Presentation)
- One of the more consistent skills that predicts decoding skills of novel words is children's phonological segmentation skills. (Hjelmquist & Sandberg, 1996 - ISAAC Presentation)
- We can help children play with sounds, combining sounds and breaking apart words, to provide classroom practice in segmentation that is helpful for both speaking and nonspeaking children.
- Phonological awareness includes rhymes, intonation/rhythm patterns, repeated sounds in words

3. **Very early phonology games** (participatory):

By helping children make meaningful distinctions in sounds they can produce, we may help them discriminate and use sounds they can't produce.

- Recognition level (e.g. amusement at different sounds)
 - Differentiation: (e.g. interrupt known sequence with unusual sound)
 - Associating movement w/ sounds (heh/heh for excited vs. yah for stop), Simon says w/sounds
 - Combination (passive) e.g. Baa/Maa/Waaah/dahdah/ hehheh/ yahyah/ -early vowel and sounds,
 - Combination play (active) by building or adapting words, e.g. Apples and Bananas
 - Sound Representation: e.g. magnetic letters, finding sounds in environment
- ** Even if child can only produce one sound, there can be a large variation in what he/she may be able to "say" by combining that one sound with selected letter sounds (using low tech or electronic aids, including modified voice recognition).

Acknowledgements: Research was supported in part by grant #K08 DC00102-01A1 from the National Institute on Deafness and other Communicative Disorders, National Institutes of Health (NIH), awarded to the second author. The authors also appreciate the contributions of the children and families who participated in these research activities.

Contact Information:

Dr. Cynthia J. Cress

202G Barkley Memorial Center

Lincoln, NE 68583-0732

email: ccress1@unl.edu

website: www.unl.edu/barkley/cress.html