

FACILITATING LINGUISTIC CODE LEARNING

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What I am going to say today is based on eight years of empirical evidence from a program at Central Institute for the Deaf. In this program, language is considered the important key factor in learning. Because language is critical for conceptualizing, reasoning and problem solving, its full development is fundamental to future growth. The communication process involves both comprehension and expression of language. Learning to understand and use the linguistic code effectively is one of the most difficult tasks facing a hearing impaired child.

At Central Institute, our program focuses on the development of oral communication skills. Emphasis is placed upon the maximum use of residual hearing to facilitate linguistic code learning.

In recent years there has been a rapidly growing awareness of the importance of the early years, birth to six. It is during these possibly critical years that basic learning sets, cognitive style and linguistic skills are established. This is the time when the patterns for processing information are laid and when the effects of the environment appear to be the greatest.

Evidence continues to mount about the effect of early deprivation to all sense modalities and its relation to cognitive development. We must also be cognizant of the amount of learning which takes place in the first year of a child's life. None of you here today needs to be convinced of the urgency for early identification of hearing loss. Early amplification is extremely important so that the auditory modality can be stimulated simultaneously with cognitive, social, emotional and importantly, language development. We must remember that the hearing impaired child's linguistic growth begins when he receives a suitable hearing aid. I think Quigley's (7, p. 109) comments about early auditory stimulation are pertinent here.

Neither fingerspelling nor the language of signs, according to the evidence we now have, will provide any panacea in replacing the ear as a communication channel. Our efforts in the very early years with deaf children, and in succeeding years, should be aimed toward the fullest possible development of whatever residual hearing the child might have. Early amplification and amplification in the low frequencies, along with home training for the child and the parents, might eventually permit more and more deaf children to use whatever residual hearing they have more effectively.

The auditory component in the vocal language system is important. Much of the phonologic code, particularly phonation, duration and prosody of speech, is audible to children with mild, moderate and

severe hearing losses. According to Gentile's 1969-70 survey (5) of over 26,000 children in special education programs for the hearing impaired in the United States, approximately 50% of these children had less than 85 dB losses in the three speech frequencies (500, 1000, 2,000 Hz.) We can communicate much about the linguistic form even to those children with minimal amounts of hearing who are in the profoundly deaf group. Temporal aspects of speech are available, giving them the rhythm of spoken thoughts. Strong patterns can be differentiated from weak ones. Certainly, variations in sentence lengths are distinguishable.

The process of learning to hear consists of learning to recognize sound and interpret it. The ideal time for learning to listen is at the time all sensory learning is developing. Then we have true integration of audition, tied to the experience, with the parent or teacher supplying language appropriate to the activity or object. Instead of training a child to listen to noise makers and bells, he should be exposed to the sounds of the linguistic code which he will speak. The child should receive feedback not only from his mother or her substitute, but also from his own voice as he is encouraged to match the adult's model. The essential conditions for learning to hear language are: the speech to be "heard" is amplified, it is given often, and it is associated with the meaning. (Simmons, 1972)

While the importance of audition has been stressed, hearing impaired children also need to learn to watch the speaker's lips and make use of the visual information that can be derived from lipreading. Whether a child uses audition or lipreading as his primary avenue for understanding the linguistic code will depend a great deal upon the individual. In any event, the two input systems reinforce each other. (Erber, 1969)

Now I would like to focus on some of the ways we help hearing impaired children develop oral communication skills at Central Institute. We agree with the linguists who feel that the ability to learn language is an innate capacity of human beings. Somehow, from the many rich and varied samples of grammatical sentences which are presented to him, the child is able to induce the structural principles. By using these rules, he then is able to generate new sentences. Children with normal hearing appear to develop language through a number of successive, increasingly complex stages. It has been our experience that hearing impaired children follow similar stages although not at the same chronological age. The stages come later and often last longer.

It is imperative that we provide the hearing impaired child with a language environment similar to that of his hearing siblings. Speech is something that surrounds the young hearing child. It functions for him. It is relevant to his manipulating his world. It grows out of moment by moment experiences that are his world. The hearing impaired child must learn that the purpose of language is to express ideas, desires and wants. He must learn what the linguistic code is, what it can do for him and how he can use it to manipulate his environment. Verbal stimulation must take place throughout the day. Of equal importance

to "how much" a mother talks to her baby or a teacher talks to the children in her class is *what* she says, *how* she says it and *when* she says it. The important thing about the language that is being "fed in" is that it is appropriate to the child's linguistic level and is based on experiences which are meaningful to him. This wide variety of language helps provide the necessary examples of language constructs.

The teacher must be "tuned in" to the child. By "tuned in" I mean that the teacher determines in any way she can what it is the child wishes to say. She then matches the appropriate language to the *child's* thought. She must anticipate the language from the child's point of view—that is—give the child the language model for what *he* wants to say in that particular situation, not what she, an adult, would probably say. Basing language instruction on ideas that the child originates makes the exchange meaningful.

At a more advanced stage of language development, the teacher begins expanding the utterances the child has initiated. His "bububutru" might be expanded to, "Look at the truck." The adult generally retains the child's word order and forms an appropriate simple sentence. There are usually a number of possibilities available as expansions, and the teacher should choose the one she believes best expresses the child's intended meaning. Brown and Bellugi (1) found that parents of hearing children expanded their utterances approximately 30% of the time. We expect the hearing impaired child to imitate the adult's expansion at whatever level he is capable. The expanded sentence provides acceptance of the child's statement. It also provides the child with a corrective model without the discouraging aspects of a direct correction. The child seems to know that the teacher has understood him and is interested in what he has to say.

Another effective device which we use as the children advance in their linguistic code learning is what Cazden (2) called "modeling". Modeling is commenting on what the child says by introducing related ideas rather than improving on it, as in expansion. If the child said, "dog bark" the person who is expanding would probably say, "Yes, the dog is barking" whereas the person who is modeling might say, "Yes, there's a cat in the tree." Expansion does limit the conversation to the child's own grammatical elements and ideas whereas modeling introduces a greater variety of ideas and grammatical elements, but both have a role in language development.

No one is sure what the role of imitation is in children's grammatical development. However, we think it is important for the hearing impaired child to imitate both expansions and models so he will get the kinesthetic-auditory feedback to help monitor his linguistic code learning and thus store structural principles.

Imitating the teacher's model is an integral part of our program at Central Institute. These imitations seem to develop in a sequential fashion. Particular emphasis is put upon the child imitating the time envelope of the teacher's model. At first the imitations resemble the jargon of the hearing child. Even though individual words may not be intel-

ligible, the correct intonation and timing are present. It sounds as if the child is saying sentences in a not quite intelligible language. Gradually most of the vowels and many of the visible consonants begin to appear appropriately. As this happens, the child's imitations more closely approximate the sentence patterns as more words and phrases are intelligible. At certain times the sentences are broken into smaller segments for closer approximation of the pattern, but the timing, phrase structure and intonation must keep their integrity. The sentence is always repeated in its entirety so that it can be stored as a whole thought.

Our program is oriented to daily experiences, either appropriately contrived or spontaneous, incidental happenings. Most of the experiences with the younger children are at the sensory-motor level. Whenever possible, the children are actively involved in the activities. Opportunities are provided for the children to see, feel, smell, listen to, put together, take apart and often eat the objects involved in a particular learning experience. This helps demonstrate the meaning of the words and aids in comprehension. Appropriate language accompanies the experience and is processed through the children during the experience. The teacher calls the child's attention to the important elements by labeling them and emphasizing the attributes. The language is being "fed in" while the child is doing an activity, expressing a feeling or responding to a specific situation.

As the child's language develops, we lead him to interpret, evaluate and integrate his experiences for himself. While verbal stimulation, expansion and modeling are still used by the teacher, questioning becomes increasingly important. By asking the right questions, the teacher is able to help children interpret their experiences and help them use language to organize the facts which they have learned through their activities. Now the teacher is stimulating the child to think, to recognize relationships and to express these verbally.

Following such activities, some of the language is put into written form with accompanying pictures. These chart stories are then used to provide some of the necessary repetition for learning the linguistic code. These stories are used for lipreading, auditory training, expressive language, speech and reading readiness. Having the language presented in written form enables the children to see the words, particularly the function words, and even the phonemes, some of which are low in acoustic power and may have poor visibility in lipreading. The language incorporates the children's ideas, but the teacher decides which language constructions to use. The sentences vary in length, type and in language structure. We try to incorporate a variety of intonation patterns, concepts, syntactic structures as well as multiple uses of words. From chart to chart we use some of the same concepts, vocabulary and syntactic structures to provide the necessary repetition.

The chart story is introduced to the children the day following the experience. The child's first exposure to the sentences on the chart is through lipreading and listening. He finds the corresponding sentence

or picture and then attempts to imitate the sentence pattern. These imitations follow the sequence described previously. As the child becomes familiar with the language, he is expected to discriminate auditorily among the sentences. It has been our experience that all children can learn to distinguish sentences from the auditory pattern alone. Gradually through practice and training, the child is able to make finer auditory distinctions and to produce closer approximations of the patterns he hears. Some may even eventually discriminate words.

Our evidence shows that children managed in this way are succeeding academically. Horizons seem to be opening wider for those children whose handicap was diagnosed at an early age and whose linguistic code learning has been facilitated by a rich and meaningful environment. An environment which has stressed the importance of aural/oral stimulation throughout the day to give the child a strong language input tied to his experience. Our evidence further supports that by using oral language as an instrument of thought, of social control and of interaction, these children are functioning in the mainstream of life.

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