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ABSTRACT

Investigated was the relative effectiveness of sign language and verbal language training in teaching 12 nonverbal hearing retarded children (4-9 years old) to communicate. Ss were randomly assigned to one of three groups: speech training (based on the Bricker, Dennison, Watson, and Vincent-Smith program), sign language training (adapted from the Bricker, et al program), and a control group. Results indicated that Ss receiving verbal or sign language training made progress, with neither group demonstrating more progress than the other. None of the Ss in the control group developed communication skills. (CL)

A Comparison of Manual and Oral Language Training with Mute Retarded Children: Year II*

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Communication deficiencies have long been recognized as among the most conspicuous and debilitating limitations of severely and profoundly retarded individuals. Many severely and profoundly retarded individuals exhibit a complete lack of the ability to communicate or communicate poorly and only through gestures. A considerable body of research has been directed toward the development of speech with children who have never exhibited meaningful expressive language (e.g., Bricker and Bricker, 1970; Guess, Rutherford, and Twichell, 1969; Risley, Hart and Doke, 1972; Sailor, Guess, and Baer, 1973; Sherman, 1965; Sloane, Johnson, and Harris, 1968). While these studies, and others, have demonstrated considerable success in developing speech with nonverbal retarded children, they have not been totally effective. Many of the children developed very limited or no useful speech. In addition, none of the attempts to develop speech with nonverbal retarded children have been successful in generating generalizations so that, after the training has been completed, the children continued to increase their vocabularies and improve their grammatical structure (Sailor, Guess and Baer, 1973).

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A plausible explanation, for these limitations in training oral communication, is that the children might not have the cognitive structures necessary for the meaningful acquisition of expressive language (Kahn, 1975a; Morehead and Morehead, 1974; Sinclair, 1971; Sinclair-deZwart, 1973). Piaget (1962) found that in normal infants, the cognitive structures necessary for gestural imitation seem to precede the cognitive structure necessary for the imitation of speech. Kahn (1975b) has verified these findings with profoundly retarded children. It appears that children functioning at stage three of Piaget's sensorimotor period are capable of using gestures while it's not until stage five that they are capable of speech. In addition, Stokoe (1975) cites evidence that hearing children of deaf parents make two-sign and longer sentences beginning around 12-14 months, much earlier than most children can use two-word sentences verbally. Stokoe also states that, in families with both deaf and hearing individuals, hearing children will sign before they speak.

There have been several different approaches used in recent years to teach nonverbal communication skills. Premack (1971; Premack and Premack, 1974) developed a synthetic (plastic-word) method of teaching language to chimpanzees. One of Premack's chimps, Sarah, learned over 130 words and many key language concepts. Carrier (1973, 1974) replicated Premack's work with retarded children and has demonstrated the feasibility of this method with retarded, nonverbal children.

Bliss symbols is another method receiving recent attention. One limitation of Bliss symbols is the highly symbolic nature of the

materials which may require too high a level of cognitive functioning for some severely and profoundly retarded children. In addition, the present investigator believes that sign language, with its wider recognition, would be more useful to retarded children than abstract plastic shapes and colors. Gardner and Gardner (1969) trained a chimp, Washoe, to use sign language with good success. Berger (1972) and Hall and Talkington (1970) have demonstrated the feasibility of sign language with deaf retarded children, while several recent studies (Bricker, 1972; Kopchick, Romback, and Smilovitz, 1975; Richardson, 1975; Topper, 1975) have demonstrated the feasibility of using sign language with hearing retarded children. However, none of these studies have investigated the relative efficacy of verbal language training and sign language training. The present study, therefore, is an attempt to determine if sign language training is a more effective method of teaching nonverbal retarded children to communicate than verbal language training.

Method

Subjects

The subjects being trained by graduate research assistants consist of 12 nonverbal, hearing, retarded children. Six of these children are living in a residential facility and six are living at home and attending a day care school. Ten of these children (five from each site) have been involved in this project since its inception two years ago. Two children (one from each site) moved at the end of the first year of the project and have been replaced.

The ages of the children ranged from 53 to 101 months at the beginning of the project.

There are an additional ten children (five receiving sign language training and five receiving verbal language training) who are being trained by their parents. These latter children have been receiving training for just one year.

None of the subjects have any audiological or motor disability that would inhibit the development of verbal or manual communication skills.

Procedure and Design

The 12 subjects being trained by the graduate assistants, were matched in threes (due to the small number of subjects) according to age, sex, and etiology. Etiology was determined using medical, psychological, and personal histories and classifications were determined using the major medical categories outlined by Grossman, et al., (1973). The matched subjects were then randomly assigned to one of the three groups receiving individualized instruction. The groups consist of a group receiving speech training using the program developed by Bricker, Dennison, and Bricker (1976), a group receiving training in American Sign Language (ASL) using a program adapted from the Bricker, et al., program, and a placebo group receiving instruction in an area other than communication.

The Bricker, et al., (1976) program is an expansion of the 1973 Bricker, Dennison, Watson, and Vincent-Smith program. The 1976 program consists of 24 phases of training beginning with sitting and ending with the production of three-word phrases.

The program includes 12 prelingual phases of training (sitting, eye control, working on a task, six phases of imitation training, two phases of functionally using objects, and an early work recognition phase) and 12 phases of training speech (imitation, comprehension, and production of nouns, verbs, two-word phrases, and three-word phrases, respectively). These are the phases of training being followed for the verbal communication group.

The Bricker, et al., (1976) program has been adapted for the manual communication group. In essence the changes in the original program consist of eliminating the five phases of training dealing with imitation of sounds and by requiring imitation, comprehension, and production of signs rather than verbalization. The manual communication training includes presentations of the verbalization, as in total communication, each time a sign is produced. However, contrary to total communication, attempts are made to elicit only the signs and not the verbalizations from the children in this training condition.

The third group (placebo) is receiving training in an area other than communication. Three of these children are receiving training on self-care skills. The fourth child is receiving play therapy in an attempt to reduce his self-stimulating behavior. Since imitation and behavior control techniques are used in these training procedures, some improvements in these areas are expected. While these four children are spoken to during this training, no

attempt is being made to have them communicate with the trainers.

Each of two trainers works with two children from each of the three groups. This is done to eliminate trainer ability and performance as confounding factors. Training is carried out for 20 to 30 minutes a day, five days a week.

An additional ten subjects are receiving training from their parents. Five of these parents have received training in the Bricker, et al., (1976) program while the other five parents have received training in ASL and our adaptation of the Bricker et al., program. At present these parents are training their own children under the supervision of a trained graduate assistant and the principal investigator. Each child receives training at least five days a week for 30 minutes each day.

At the end of each year of the project, testing for all the subjects is accomplished using a double-blind procedure. The trainer of each child attempts to elicit the desired response from the child. The person testing the child does not know which group the child is in and is not able to see what the trainer is doing. In this manner, the tester does not know what sort of response (oral, manual, or none) is expected of the child nor does he know what response (speech or sign) is appropriate. He is merely able to record what he sees and/or hears the child do or say.

Results and Discussion

At this point in the research, the results indicate improvement

by all of the subjects receiving training in communication skills. All eight of the subjects receiving verbal or sign language training from the graduate assistants have made good progress. Each of these subjects began training at very early phases of training (i.e., behavior control or gross motor imitation) and are presently learning to imitate, comprehend, or produce signs or verbalizations. Specifically, in the signing group, one child imitates 16 signs, comprehends 14 signs, and independently produces nine signs. He also imitates 13 two-sign phrases, comprehends 4 two-sign phrases, produces 2 two-sign phrases, and imitates 1 three-sign phrase. In addition, he has increased his vocalizations and says one word with the sign.

Another signing group child imitates, comprehends, and produces 19 signs, can imitate and comprehend six two-word phrases, and says four words with the signs. The other two signing children have been in the program for less than eight months, having replaced the two children lost to the project. One of these children imitates 12 signs, comprehends five signs, produces five signs, and produces three two-sign phrases. The other signing child imitates and comprehends two signs. The two subjects who have been lost to the project (they moved away from the available training sites) had, at the end of their year long participation, made some progress. They were both about to enter the imitation and comprehension of noun phases of the project, having completed all of the preceding phases. Thus, all four signing children still in the project have begun to learn to communicate and the two children no longer in the project made progress while participants.

The children in the verbal training group have also progressed. One child in this group imitates ten words, comprehends 12 words, and independently produces nine words. Two other children in this group imitate two words, comprehend three words, and independently produce two words. The fourth child in this group is still learning to imitate the component sounds of words.

None of the placebo children have developed any skills in communication. They each have made some slight progress in behavior control skills and two of them have made slight advances in gross motor imitation. As was pointed out in an earlier section of this report, these gains were expected and related to their training as placebo subjects.

Each of the ten children being trained by their parents (five in sign language and five in verbal communication) have made some progress. All of these subjects have advanced from two to six phases in the training program. The improvements include two of the children in the signing group acquiring three and six signs respectively and one of the children in the verbal group acquiring six words. It should be noted, however, that these children have been receiving training for less than nine months and that the parents are still learning the program with assistance from the graduate assistant and principal investigator. We have recently noticed (in the last three months) improvement by both the parents and their children. That is, most of the improvements noted for these children have occurred in the last 90 days. At this point, neither group can be

shown to have demonstrated more improvement than the other group. More time is needed to assess the effectiveness of the parents as language trainers of their children.

One problem we have encountered, in the parent-trainer part of the project has been with parents not wishing to continue their participation. It appears, from conversations with those parents who have withdrawn, that some parents, who are at first willing to participate, later decide that they don't want to use a structured training program with their children. We are continuing our efforts with the ten still participating parents who express positive feelings about their participation.

As for the subjects being trained by the graduate assistants, the results are, thus far, not conclusive. However, we do feel that we can make some positive statements at this time. First, the training procedures for both speech and signing have been moderately successful. The far greater progress that all eight of these subjects have made than the four placebo subjects indicate this success. Second, it appears that some transfer, from manual signs to verbalizations, can occur spontaneously if the verbalizations are paired with the manual sign. The significance of this finding is extremely important to this study. Some theorists, in particular those who insist upon the importance of cerebral dominance, would hypothesize that this transfer would not occur, and that the learning of sign language may hinder the learning of speech. However, this finding of transfer indicates that the learning of sign language is not a

hinderance to the learning of speech. Indeed, the learning of sign language may be helpful to the mentally retarded child who is having difficulty learning to speak. It may be that sign language is a means by which retarded children, who are at too low a cognitive level to learn to speak, can learn to communicate.

Further research on this project will attempt to determine more fully if a sign language training program is more effective (i.e., more efficient in teaching communication skills) than a direct speech training program. We will also continue to study the frequency of the transference from signs to verbalizations.

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