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A STUDY OF THE EFFECTS OF AUDITORY TRAINING ON REMEDIAL READING.

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COMBINATIONS OF READING AND AUDITORY PROGRAMS FOR RETARDED READERS WERE VARIED TO DETERMINE THE EFFECTS ON THE SHORT AND LONG TERM READING SKILLS. FORTY-THREE THIRD-GRADE NEGRO AND PUERTO RICAN SOCIALLY DEPRIVED STUDENTS SERVED AS SUBJECTS. THEIR READING LEVEL WAS AT LEAST ONE GRADE LEVEL BELOW THEIR ACTUAL GRADE PLACEMENT. THERE WERE THREE EXPERIMENTAL AND ONE CONTROL TREATMENT GROUPS. THE EXPERIMENTAL GROUPS RECEIVED AUDITORY TRAINING ONLY, READING INSTRUCTION ONLY, OR A COMBINATION. FOUR TUTORS TAUGHT SMALL GROUPS 3 TIMES PER WEEK FOR 5 MONTHS. READING TESTS AND AUDITORY TESTS WERE ADMINISTERED. TESTING WAS DONE PRIOR TO THE TREATMENT, IMMEDIATELY FOLLOWING THE TREATMENT, AND AGAIN 6 AND 12 MONTHS LATER. ANALYSIS OF COVARIANCE WAS USED TO ANALYZE THE DATA. THERE WAS NO OVERALL SUPERIORITY FOR ANY TREATMENT GROUP ON THE INITIAL POST-TEST. AT THE END OF 6 AND 12 MONTHS, THE READING SCORES FOR ALL GROUPS INCREASED. THERE WAS A TUTOR BY TREATMENT INTERACTION AND AN ETHNIC GROUP BY TREATMENT INTERACTION. THE EVIDENCE SUGGESTS THAT THE VARIOUS COMBINATIONS OF READING AND AUDITORY PROGRAMS USED IN THIS STUDY DID NOT SEEM TO GREATLY AFFECT IMPROVEMENT IN READING. THIS PAPER WAS PRESENTED AT THE AMERICAN EDUCATIONAL RESEARCH ASSOCIATION CONFERENCE (CHICAGO, FEBRUARY 17, 1966). (BK)

A Study of the Effects of Auditory Training on Remedial Reading[1,2]

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A Study of the Effects of Auditory Training on Remedial Reading

One of the intriguing and complex problems arising from work with socially disadvantaged children is knowing how to make up their deficits in school skills. Much attention is now focused on compensatory education for preschool children as a preventive way of dealing with incipient school difficulties. However, there still remains the problem of what to do for and with the children who have already failed in school, i.e., children who are retarded readers.

The study reported in the present paper was concerned with the problem of how to retrain retarded readers from socially disadvantaged schools, and particularly how to retrain them in the most efficient way.

At the Institute for Developmental Studies, New York Medical College, where the study was carried out, previous work had given indication of some of the variables associated with reading retardation. One set of variables that seemed persistently linked with reading retardation over several grade levels was auditory perceptual skills.

On the basis of that empirical evidence as well as evidence from other studies, it was argued that there might be differing relationships between auditory perceptual skills and reading at differing ages. In the early stages of reading learning when decoding skills are predominant, that relationship might be strong, but in later stages of reading when meaning skills increase in importance, then the strength of the relationship between auditory and reading skills might decrease. It could then be argued that perhaps amelioration of any auditory perceptual deficits present when the child was in the early stages of reading, when the relationship between auditory and reading skills was strong, might positively affect learning to read.

Further, it was thought that if the auditory deficits were a concomitant of environmental conditions, i.e., that their retarded development was a consequence of restricted learning conditions, it might then seem possible that a developmental program of auditory perceptual skills given to young retarded readers might facilitate their reading learning. It could be hypothesized that once such auditory deficits were eliminated, then transfer of the auditory skills to the reading learning should occur as automatically as it appears to do among children from higher socio-economic backgrounds.

Based on those premises a study, supported by the U. S. Office of Education, Title VII New Media, was undertaken. The general design was to vary combinations of reading and auditory programs for retarded readers to see what short-term and long-term effects such combinations of programs might have on the children's reading skills.

The sample for the study was composed of third-grade children, Negro and Puerto Rican boys and girls, from socially disadvantaged schools, who were judged to be retarded readers. The criterion for that designation was that each child was at least one reading grade level below his actual grade, or on a mid-second-grade level or below. Other criteria were also used: children were eliminated because of behavior problems; marked speech, vision, hearing or other health impairments; non-fluency in English, etc. All of the children had scored 80 or above on a school-given intelligence test.

Thus, the sample was not representative of third-grade retarded readers, but included only those children who were considered teachable even though they had failed to learn in the classroom situation. Since the criteria used for selection of the children were considered important for successful

remediative effort, the descriptive study rather than an inferential study was undertaken. In other words, the chances of success for reading and auditory programs was maximized through the selection of the children.

Three types of treatment groups and a control group were used in the study. The treatment groups were: (1) an auditory program only; (2) a reading program only; and (3) an auditory and a reading program taught successively. The total time of the children with the tutors was equalized, that is, groups 1 and 2, receiving only one kind of program, also had a non-instructional activities program with the tutors.

All of the children were given batteries of reading and auditory tests before the programs began, and then were given the same tests three times more, the first time directly after the programs had ended, the second time six months after the programs had ended, and the third time one year after the programs had ended. The retests were given to ascertain what long-term effects, if any, the various training programs had on reading achievement and auditory skills.

The reading tests used were standardized tests measuring global reading achievement, oral reading skill, sight vocabulary, and word analysis skills. Most of the ten auditory tests were constructed for the present study or for other Institute studies. The tests fell into four areas of auditory perceptual skills. The four areas were thought to be specifically related to reading skills. They were: (1) recognition which was identification and/or reproduction of environmental sounds, whole words and phonemes; (2) discrimination of phonemes and words; (3) attention to auditory stimuli; and (4) memory for auditory stimuli.

The auditory curriculum was also constructed for the study. It was a developmental program, meaning that the skills were taught in a sequence

ordered by difficulty level, as judged by the staff. The program was based on the four areas described above. The program began with familiar material, such as environmental sounds which the children indentified, and then progressed within the four areas from the simple to the complex. For example, in the discrimination area whole words, word parts and phonemes were presented until the child was able to handle fine sound discrimination among small sound units. Visual reinforcement was eliminated as far as possible; there was a minimum use of pictures, alphabet letters and words in the program.

The reading program used an individualized approach based on the reading skill deficiencies of the particular children in the groups; traditional remedial procedures were thus used in the study.

A total of 50 lessons were given; each lesson was one hour and ten minutes long. The children who received only one program received 105 minutes a week of instruction and 105 minutes of non-instructional activity time, while those receiving both the reading and auditory program received 105 minutes of each per week. The sessions were held three times weekly for five months of the school year, January through May. The 43 children receiving instruction were seen in groups of three or four; four tutors participated in the study.

The primary analysis of the data, the only analysis to be reported in the present paper, concerned the interactions of the various treatments and other variables in relation to reading achievement, which was an analysis of covariance design. Covariates were used because two sets of variables were thought to have possible effects on the post-treatment reading scores: (1) the intelligence of the children, as measured by the Lorge-Thorndike Intelligence Test; and (2) the initial levels of the auditory or reading skills. Therefore, for each analysis the covariates were intelligence and

the initial test score of that particular auditory or reading test used as the dependent variable.

There were four variables which were thought to be associated with reading improvement so they were used as independent variables in the analysis of covariance. They were: (1) the type of treatment--reading, auditory, or reading and auditory programs combined, as already described; (2) the ethnic group of the child--either Negro or Puerto Rican; (3) the effect of each individual tutor; and (4) the time when the post-program testing was done--either immediately after the program ended, or six or 12 months later.

Because of the small N's in the treatment groups, two three-way analyses were done instead of a four-way analysis of covariance. The first combined treatment, tutor and time, and the second analysis combined treatment, ethnic group and time. Since treatment and time were considered the most likely variables to be linked to reading achievement, they were used in both of the analyses.

The results of the analyses were disappointing. They showed no general overall superiority for any of the three programs. There was no great increase in reading and/or auditory skills with any of the programs, as shown by the test scores obtained immediately after the programs had ended. In addition, when the post-treatment reading scores of the three treatment groups were combined, they were not superior to the reading skills of the control group.

However, in the subsequent testing periods, at six and 12 months after treatment, there was an increase in reading scores for the total groups, including the control group, indicating that with passage of time--and time in school--there were higher reading scores. Since there were no tutor or

ethnic group effects on the reading skills, apparently only one of the independent variables, time, had any association with increase in reading scores.

There were, however, some interesting interaction effects. First, there were tutor by treatment effects for most of the reading tests and for six of the auditory tests. The combination of the tutor's approach and the particular program she was teaching seemed to be associated with increase in reading and auditory skills. For the reading skills, the tutor-treatment combination was always associated in the same direction, that is, if scores increased on one reading test they increased on all of the reading tests; the converse also held true for decreases in scores. There was no such consistency on the auditory tests.

Apparently, then, teachers seemed to affect the teaching programs to the degree that some combinations of the two were associated with reading improvement. Unfortunately, no measures of teacher characteristics were included in the study, and there were too few interactions of teacher and treatment to have any discernible pattern. In addition, there were indications that the characteristics of the children in the particular groups, also unmeasured, may have been the contributing variable to tutor differences. In summary, then, the interactions of the teacher and the program were present but their meaning was unclear.

The other interesting interaction was that of the combination of ethnic group and treatment. Improvement in reading scores for the Negro children seemed to be related to the reading program, while improvement in reading scores for the Puerto Rican children seemed to be related to the auditory program. Conversely, there was a negative relationship of reading instruction and reading improvement for the Puerto-Rican children and a negative relationship of auditory instruction and reading improvement for the Negro children. Evidently the Puerto-Rican children did not benefit

from the reading program alone and the Negro children did not benefit from the auditory program alone. Apparently, for the Negro children reading training alone facilitated reading improvement, but for the Puerto Rican child reading alone was not enough.

One possible explanation is offered. The Puerto Rican children might have a limited knowledge of English sounds and discriminations, and, therefore, auditory instruction could facilitate use of those skills in learning reading skills. On the other hand an auditory program might confuse Negro children since the sounds of their dialect are similar to standard English sounds. Negro children might possibly need to unlearn some of the sounds of their dialect in order to use the sounds of standard English in learning to read.

In summary, the various combinations of reading and auditory programs used in the study did not seem to greatly affect improvement in reading. The tutor-program and ethnic group-program combinations effects that were found suggested that there were complex interrelationships of variables in the learning-to-read process. The complexity of the findings was confirmed in part by a qualitative analysis of child behavior and of the auditory program, not reported in full in this paper. Child characteristics such as degrees of motivation, distractibility, disruptiveness, ability to concentrate on the task, and ability to work independently were judged by the tutors to have been important factors in potential reading improvement. Such factors, not controlled in the study, may have had strong association with reading achievement.

Thus, the evidence presented suggest that although auditory perceptual training did facilitate, to some degree, reading learning for one group, Puerto Rican children, that evidence was too weak to conclude that such

programs as used in this study were beneficial to reading learning.

In a supplementary study, reading and auditory programs were combined in the same lesson rather than taught successively, and visual and kinesthetic reinforcement of skills were added to the program. Because the tutoring program was not of the same length as the first program it was difficult to compare the results of the two. The subjective judgments of the staff were that the new program brought better results, but there was no hard evidence to support that contention. Therefore, the best that can be said is that perhaps combinations of reading and auditory skills other than those used in the present study might be useful to the retarded reader from a socially disadvantaged background, but no overwhelming support for the programs tested in the present study can be given.