THE EFFECT OF SPEECH INSTRUCTION ON THE ABILITY OF CLASSROOM TEACHERS TO SELECT CHILDREN FOR SPEECH THERAPY

A Thesis

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by

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CHAPTER I

INTRODUCTION

Many times, persons who are neither speech clinicians nor have ever taken an academic course in speech therapy find that they must judge the relative defectiveness or normalcy of another's speech. The mother who brings her child to a speech clinic because, in her opinion, he 'lisps badly' is making such an evaluation. The teacher who must refer the children with inadequate speech to the speech clinician is also usually untrained in making such judgments. The friends who suggest that a person has improved sufficiently to stop taking speech therapy may provide yet another example.

The usual practice is to seek the opinion of the professional speech clinician to determine whether a person has or has not a speech problem, to evaluate the severity of a speech problem, or to judge whether speech has improved after therapy. Is it only the speech clinician who can evaluate a person's speech; or is the opinion of the lay person, who has had no formal training in speech therapy, valid? It was the purpose of this study to investigate whether or not there is a similarity in the ratings of severity given by clinicians and classroom teachers.

The number of speech cases in the United States is estimated to be two million or 5 per cent of the school population. Seventy to 85 per cent of these children have functional articulatory problems. The shortage of clinicians makes it necessary to establish some program of

speech instruction referral in the schools.[1]

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[1]Charles Van Riper, Speech Correction Principles and Methods, New York: Prentice-Hall, Inc., 1935, p. 10.

According to Parks "the teacher's first task in helping the speech defective is to find them."[2] Gray found that teachers with no

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[2]Merel Parks, "The Classroom Teacher and Speech Correction," Quarterly Journal of Speech, XXVIII (December, 1942), 471.

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experience to twenty-nine years of experience did not differ in their ability to detect speech defects. These teachers, however, were not required to recognize specific articulatory defects or refer the children for treatment. The author thought that if teachers had the ability to conduct speech activities, skill to correct minor defects and refer children for therapy, the clinician could spend more time with severe cases of functional and organic etiologies.[3]

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[3]Eugene Taylor Gray, "An Experimental Study of the Influence of Experience on Teacher's Identification of Speech Defects," (Unpublished Master's Thesis, The University of West Virginia, Morgantown, 1951), p. 4-15.

McCroskey evaluated an inservice training program for the correction of functional articulatory problems by teachers of the first grade. He found that a group of first-grade children receiving therapy from the teachers attending the training program progressed at about

the same rate as a group of matched children receiving therapy from several speech clinicians. A control group of first-grade children with similar problems did not receive therapy. Their speech did not improve during the time covered by the experiment.[4]

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[4]Robert Lee McCroskey, "An Objective Evaluation of an In-service Training Program for the Correction of Functional Articulatory Disorders by Teachers of the First Grade," (unpublished Master's Thesis, The Ohio State University, Columbus, Ohio, 1952), p. 4-10.

An assumption relative to speech-error recognition ability might be that training in speech and hearing therapy equips the clinician to do a much more effective job of selecting children than can be done by classroom teachers. If it does, then great effort should be put forth by the clinicians to survey personally the school population to which he is assigned. If, however, the classroom teacher is as effective as the speech clinician in this task, then it would appear that it would be far more economical to rely on teacher referral.

Anderson states, "The responsibility to help the speech clinician rests with the classroom teacher. Carryover of good speech habits can best be done in the classroom, as speech cannot be separated from other academic activities."[5] A large percentage of the defects are correctable

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[5]Virgil Anderson, "The Speech Handicapped Child in the Classroom," Education, LXXVII (October, 1956), p. 123.

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if recognized in time and proper methods are used. The author states

that it is the responsibility of the classroom teacher to recognize specific speech problems and categorize the children according to the problems present.[6]

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[6]Ibid., p. 125.

The Problem

Due to the shortage of speech clinicians, the teachers may be called on to detect children with specific articulatory problems and refer these children to the clinician. If the teacher could refer efficiently, the time that is required for the clinician to screen a large school to find the children needing therapy could be used in the treatment of children who have serious problems.

Statement of the Problem. It was the purpose of this study to compare elementary teachers not receiving speech instruction, elementary teachers receiving speech instruction, and speech clinicians in their ability to detect and refer children in need of speech therapy.

These questions were asked: (1) When comparing the three groups, was there a significant difference in referral ability? (2) When comparing the three groups, was there a significant difference in ability to rate speech competency? (3) When comparing the three groups, was there a significant difference in sound-discrimination ability? (4) When comparing the related scores from Group I and Group II, did one area of ability correlate significantly with each of the other two areas? Was each group independent of the other two groups on referral

ability?

A complete analysis of these questions may be found in Chapter IV.

Importance of the Study. Johnson estimates the number of children with speech problems in the United States to be approximately two million. The shortage of speech clinicians in the school has created many problems for the clinician. One of these, initial screening for children with articulatory problems, requires a great deal of time. Since defective articulation is the most common type of all speech problems found in young children, the ability of the elementary teacher to detect and refer children with articulation problems would enable the speech clinician to spend more time in the treatment of severe speech disorders.[7]

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[7]Wendell Johnson, Speech Handicapped School Children, (New York: Harper Brothers, 1956), p. 1.

It was reported at the 1950 White House Conference that there were approximately two million children in the United States with speech problems. These children composed about 5 per cent of the school population. Of the 5 per cent, 3 per cent had functional articulatory problems. There were 1,200,000 cases of this type between the ages of five and twenty-one years. If all ages were included, the number approached 4,500,000.[8]

[8]American Speech and Hearing Association Committee on Midcentury White House Conference, "Speech Disorders and Speech Correction," Journal of Speech and Hearing Disorders, XVII (June, 1952), p. 129-30.

The parents of the children with functional misarticulations have looked to the schools for help. Few public and parochial schools had done anything about the problem in the past, but were found to be growing in their ability to meet the speech needs of elementary school children.[9] Van Riper suggests that the school is the best place for

[9]Ibid., p. 130.

the rehabilitation of persons with speech problems, since the child is observed when the therapy is needed most. The schools, in many instances, can employ a speech clinician.[10]

[10]Charles Van Riper, Speech Correction: Principles and Methods, New York: Appleton Century Crofts, Inc., 1956, p. 11.

Definition of Terms

For the purpose of this study the following terms are defined:

Functional, as it refers to speech, indicates the misuse of an organically adequate mechanism.

Articulatory refers to a speech deviation which may be characterized by substitutions of one sound for another, omissions of sounds,

additions of sounds, and distortions of sounds.

Disorder refers to a deviation from the normal speech pattern. Speech is called a disorder when it (1) calls attention to itself in an uncomplimentary manner, (2) interferes with communication, and/or (3) causes poor emotional adjustment of the speaker or the listener.

Organization of the Remainder of the Thesis

The remainder of this thesis will be devoted to familiarizing the reader with studies related to the present problem, the procedures followed in this study, the data and analysis, and the conclusions.

CHAPTER II

REVIEW OF THE LITERATURE

Although some public-school speech clinicians and specialists on staffs of state departments use a teacher referral system for locating children with speech or hearing problems, the efficiency of this system has been only partially studied. If speech or hearing services are to be successful, the cooperation of the classroom teacher must be secured. It is reasonable to assume that the ease with which this cooperation may be secured and the degree to which it may be expected will be related to the knowledge and training of the classroom teachers and to the attitudes they now hold. In order to determine the status of speech therapy as it exists in the minds of classroom teachers, the finding of answers to certain questions should be of considerable assistance. What is the classroom teacher doing about speech? What is her knowledge about helping the child with the speech handicap? What are the attitudes of the teacher toward doing this type of work? What does the teacher know concerning the activities of the speech correctionist? In order that these pertinent questions may be considered, a review of literature is presented under the following headings: (1) efficiency of teacher referrals, (2) numerical measurement of speech, (3) speech-sound discrimination.

The Efficiency of Teacher Referrals

Diehl and Stinnett designed a study to answer the question,

"What is the efficiency of the teacher referral system?" Persons from seventy-two counties in Kentucky, containing seventy-seven schools in twenty-one school districts, with three thousand two-hundred second-grade children, cooperated in the study. No speech clinicians were employed in the schools represented. A questionnaire was sent to the second-grade teachers in the schools. They were instructed to group their boys and girls according to four classifications: (1) normal speech, (2) articulatory deviations, (3) phonatory problems, and (4) disturbances of rhythm.

The children included 1,562 boys and 1,499 girls with a mean age of seven years and ten months. The authors recorded twenty-five children's voices which ranged from normal speech to speech with problems. This sample was presented for an evaluation by five trained clinicians from the University of Kentucky. The authors rated the sample also, and their results correlated 1.0 with the five clinicians.

The second-grade teachers identified 363 or 57.3 per cent of the 634 speech problems. They failed to identify 271 or 42.7 per cent of the children with problems. Two hundred and ten or 81.6 per cent of the severe articulatory deviations were identified. Three hundred and four or 42.7 per cent of the mild cases were correctly identified. Considering the total number of children, two out of every five were not identified. Two hundred and twenty-one or 58.9 per cent of the boys and 142 or 55.9 per cent of the girls were identified.

The results of the Diehl and Stinnett study indicate that teachers can locate children with speech difficulties with less than 60 per cent

accuracy. Severe articulatory cases may be identified with better than 80 per cent accuracy. The teachers were least skilled in recognizing vocal disorders. Boys with speech problems were apparently recognized as well as girls with speech problems. "Teachers with no orientation can be expected to miss two of every five children classified as defective by clinicians." The authors reported that an in-training program to help teachers is justified by their findings.[1]

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[1]Charles F. Diehl and Charles D. Stinnett, "Efficiency of Teacher Referrals in a School Speech Testing Program," Journal of Speech and Hearing Disorders, XXIV (February, 1959), 34-36.

Ainsworth and Lloyd, in an Ohio survey, interviewed fifty-five teachers who taught grades one, two, and three. They found that teachers were not familiar with the speech clinicians' activities. The teachers did not try to create an attitude of acceptance for the children with problems in the classroom. One-half of the teachers believed they could describe what the child did when he made a sound incorrectly. The presence of speech clinicians in the schools represented did not insure an increase in speech activities in the classroom nor improve the attitude of the teacher. Teachers were aware of their general inadequacies; and fifty-two of the fifty-five felt speech training was useful and necessary. The authors stated that an investigation should be made by the teacher "noting the specific sounds involved in the speech defect." The results of this study have some important implications for the training of speech clinicians and the speech education of the classroom

teacher. It appears that teachers are ready to function more effectively in regard to speech problems. They are generally aware of their inadequacies, and feel that speech work is useful and necessary. There is little evidence that they would be resistant to efforts to help them do a better job.[2]

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[2]Gretchen Wright Lloyd and Stanley Ainsworth, "The Classroom Teacher's Activities and Attitudes Relating to Speech Correction," Journal of Speech and Hearing Disorders, XIX (June, 1954), p. 244-48.

Emery reviewed Ainsworth's findings and suggested that the teacher's speech examinations should include the condition and structure of the child's speech mechanism, a hearing test, a history of developmental factors, tests for footedness and handedness, test for coordination, motor control, and factors relating to the home environment.[3]

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[3]Richard M. Emery, "The Classroom Teacher and Speech Correction," Elementary School Journal, LVI (November, 1955), p. 110-16.

Parsons conducted an experiment at the Fairmount School in West Orange, New Jersey, in which twenty-two classroom teachers participated. The teachers' average teaching experience was sixteen years. None of the teachers had taken a course in speech correction. The experiment lasted for eleven school months and five activities were included. The five activities were: (1) a course in speech correction, (2) clinical work with children, (3) demonstration of speech activities in the

classroom, (4) giving printed materials to the teachers, and (5) presenting the experiment to groups of parents. Questionnaires were sent to the children, teachers, and parents who participated in the study in order to evaluate the results. Nine teachers felt that they had only been helped slightly in diagnosing speech defects, but ten teachers said they had been helped significantly in diagnosis. The experiment was apparently successful in making teachers and children aware of speech habits and stimulated interest in speech improvement. The author drew the conclusion that "speech education can be effectively provided through teacher in-service education; but continued guidance by a specialist is necessary.[4]

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[4]Robert R. Parsons, "An Experiment in Speech Education in the Elementary Schools," Quarterly Journal of Speech, XXXI (April, 1945), p. 218-22.

According to Smith, maturation does not eliminate a speech handicap if the child is above the third grade. For this reason, teachers should have knowledge of speech training and diagnosis. The teacher should not be held responsible for ascertaining the nature of serious speech disorders, but the essence of their contact with children in the classroom makes it likely that they would recognize deviant speech.[5]

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[5]David Wayne Smith, "The Teacher's Responsibility for Speech Difficulties," Education, LXXVIII (December, 1957), p. 242-44.

Numerous writers have commented upon the efficiency of certain procedures which are employed in school systems to locate persons in need of speech rehabilitation. Suydam states that there are four principal methods employed by speech clinicians for locating those youngsters in need of speech training: (1) referral method, (2) speech survey, (3) combination of referral and survey and (4) voluntary enrollment. On surveying public-school clinicians in eight states in the Middle West, Suydam discovered that 75 per cent of the clinicians were employing the survey method either alone or in conjunction with teacher referrals. Only 24 per cent of those replying to her questionnaire indicated that they relied completely upon teacher referral of cases.[6]

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[6] V. R. Suydam, "Speech Survey Methods in the Public Schools," Journal of Speech and Hearing Disorders, Vol. 12, (1948), p. 51-54.

Ainsworth believes that a disadvantage of the referral method is in the added burden placed on the classroom teacher at the outset of the school year. He states that this method results in saving of time but warns that the classroom teachers should have prior instruction by the clinician in order that teachers may learn which children are in need of referral. He suggests that clinicians need not feel committed to any one procedure but that a combination of survey and referral might well be employed.[7]

[7]S. Ainsworth, Speech Correction Methods, New York: Prentice-Hall, Inc., 1948, p. 163.

Irwin recommends that a survey of a school population should continue throughout the school year until the clinician has completely surveyed his area. In the following years, the clinician tests entering first-grade pupils, transfer pupils, referrals, and those children who have previously been enrolled in the speech therapy classes or are yet on a waiting list. It appears that referral is looked upon as a method with some merit but as sort of a 'second-best' to the individual interview of children that takes place in the comprehensive survey.[8]

[8]R. B. Irwin, Speech and Hearing Therapy, New York: Prentice-Hall, Inc., 1953, p. 119.

It was the purpose of a study done by Oyer to assess speech-error recognition ability of two groups of college seniors. One group was composed of 20 seniors majoring in speech and hearing science. The other group was composed of 20 seniors majoring in elementary education. The group in elementary education had had one course in speech problems. The null hypothesis under test was as follows: There is no significant difference in speech-error recognition ability between seniors in elementary education and seniors in speech and hearing science. On the basis of the data obtained within the experimental confines of this study, it is impossible to reject the null hypothesis set forth at the

outset. Assuming that the relative skills of each group remained in the same proportion, it could be inferred that elementary teachers might well operate as successfully in selecting the children for the speech and hearing case load as the public-school speech and hearing clinician. Oyer states that the outcomes of the study might have been somewhat different, however, if the subject population had been partially comprised of some normal speakers instead of all non-normal ones.[9]

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[9]Herbert J. Oyer, "Speech Error Recognition Ability," Journal of Speech and Hearing Disorders, Vol. 24, November, 1959, p. 391-4.

The purpose of a study by Perrin was to investigate whether there was any difference in the ratings of severity given by trained and untrained observers to samples of functional misarticulations. The voices of seven children with varying degrees of articulatory difficulty were recorded and arranged on magnetic tape in a prearranged order for paired comparisons. The tape was played before two groups of judges, one group with no training in speech therapy and the other group with a great deal of training. The judges made their ratings on specially prepared sheets, and the following results were obtained:

1. Trained and untrained judges do not differ significantly in their evaluations of the severity of functional articulatory defects.
2. Both the trained and untrained judges showed a significant amount of agreement within their respective groups in their rankings.

3. There were many inconsistencies in ranking shown by members of both groups.

4. The correlation coefficient between the number of sounds misarticulated and the judges' rankings was significant at the 4 per cent level for the untrained judges and significant at better than the 1 per cent level for the trained judges.[10]

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[10]Elinor H. Perrin, "The Rating of Defective Speech by Trained and Untrained Observers," Journal of Speech and Hearing Disorders, Vol. 24, February, 1959, p. 48-50.

The Numerical Measurement of Speech

Several studies using judges' ratings of recorded speech have been done at The Ohio State University. These judges were trained according to the methods determined by Morrison. Using the method of equal-appearing intervals, Morrison constructed a severity scale of articulation defectiveness. Observers were asked to place samples of children's speech along a one to nine severity continuum, one denoting least severe and nine denoting most severe articulation defectiveness. In a subsequent study, Sherman and Morrison used the original Morrison samples of speech to determine the reliability of individual ratings of defective articulation. They concluded that speech samples can be reliably placed in relative positions along a severity continuum, even though absolute ratings of the severity of defectiveness are not necessarily comparable from one individual observer to another. They also

concluded that results would be equally reliable when either five- or 10-second speech segments were used.[11]

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[11]Dorothy Sherman and Sheila Morrison, "Reliability of individual ratings of severity of defective articulation," Journal of Speech Hearing Disorders, Vol. 20, 1955, p. 352-358.

One attempt to assign a numerical score to defective articulation was made by Wood. He asserted that consonantal sounds played the most important role in speech intelligibility and constructed an Articulation Index based on Travis's table of the frequency of occurrence of consonant sounds in the speech of American children. He prorated the values of Travis's table into the initial, medial and final positions in words. The numerical values of the sounds correctly produced on an articulation test were added together to obtain a quantitative description of the child's ability to articulate sound correctly.[12]

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[12]K. S. Wood, Measurement of progress in the correction of articulatory speech defects, Journal of Speech Hearing Disorders, Vol. 14, 1949, p. 171-174.

Most of the presently available methods of measuring articulation involve time-consuming subjective evaluations of defectiveness. The investigation by Barker was undertaken to construct an Articulation Score to represent numerically a person's articulatory proficiency. A numerical value was assigned to each sound in direct proportion to the number of times that sound would probably occur in a sample of 100

sounds. Forty-five children whose articulation ranged from normal to severely defective were given an articulation test and assigned articulation scores. The articulation scores were correlated with ratings by trained judges of the speech of the same children, a method of proven reliability. Barker states, "The Articulation Score is numerically accurate, statistically manipulative, easily interpreted and convenient and simple to use."[13]

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[13]Janet O'Neill Barker, "A Numerical Measure of Articulation," Journal of Speech and Hearing Disorders, Vol. 25, February, 1960, p. 87-88.

Speech-Sound Discrimination

The purpose of Zedler's study was to evaluate the effect upon speech-sound discrimination and written spelling of a method of phonic training which included (a) auditory training and (b) association of speech sounds with alphabetic symbols. Experimental and control groups were selected among second-grade public school pupils in five Texas towns. One hundred and seventeen pupils comprised the experimental group and 115, the control. Tests of speech-sound discrimination and written spelling performances were administered to the two groups before and after the experimental group had received 14 hours of phonic training. On the basis of experimental results the following conclusions seem warranted:

1. Written spelling performance changes significantly and

favorably with this method of training in phonics.

2. Speech-sound discriminative ability increases significantly with the phonic training.
3. Written spelling ability and speech-sound discrimination are significantly related variables.[14]

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[14]Empress Young Zedler, "Effect on Phonic Training on Speech Sound Discrimination and Spelling Performances," Journal of Speech and Hearing Disorders, Vol. 21, June, 1956, p. 249.

Van Riper has expressed an opinion that perceptual deficiencies are a major cause of articulatory disorders.[15] Even though studies of

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[15]C. Van Riper, Speech Correction: Principles and Methods, New York: Prentice-Hall, Inc., 1954.

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phonetic discrimination have not shown conclusively that there is a difference between articulatory cases and normal subjects, many clinicians act upon the assumption that articulatory cases need a great deal of work in auditory perception before they can develop correct patterns of speech.

Schiefelbusch and Lindsey undertook a study to develop an improved instrument for testing the sound-discrimination abilities of children. A carefully selected series of ninety picture cards was presented to matched groups of children with defective articulation and children with normal speech. Three methods of presentation were used. In one method the tester monitored thirty of the cards to the child; in

the second method the child named thirty cards; and in the last section, the child evaluated thirty of the cards silently. Each section contained an equal number of cards involving rhyming, initial, and final sounds. All data were carefully analyzed for comparisons of the groups.

Schiefelbusch and Lindsey found significant differences between the children in the speech-defective and the normal speaking groups in relation to sound-discrimination abilities. The differences were also significant in relation to each form of discrimination: rhyming, initial, and final sounds. The method of presentation did not show any conclusive results which would indicate that speech-defective children have greater difficulty in discerning self-monitored sound patterns.[16]

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[16]R. L. Schiefelbusch and M. J. Lindsey, "A Test of Sound Discrimination," Journal of Speech and Hearing Disorders, Vol. 23, May, 1958, p. 153-156.

Summary

Three areas were covered in this review of the literature: (1) the efficiency of teacher referrals, (2) the numerical measurement of speech, (3) speech-sound discrimination.

According the Diehl and Stinnett, teachers make referrals with less than 60 per cent accuracy. One-half of the teachers interviewed by Ainsworth and Lloyd thought they could detect misarticulations.

Emery indicates that speech examinations given by teachers should include a large battery of tests. This investigator considered the teachers who participated in the experiment to be lacking in the preparation necessary for the speech examination suggested by Emery. Inexperienced teachers, for example, could not be expected to give hearing tests and examine the structure of the speech mechanism. Parsons concluded that speech education can be effectively provided for teachers through inservice training. The study done by Oyer indicates that speech and hearing majors and education majors are similar in ability to detect misarticulations. Suggestions on using the referral method are included from Suydam, Irwin, and Ainsworth.

The numerical measurement of speech is applied to misarticulations by Wood. Barker did a similar study applying a numerical measurement to articulatory proficiency. Sherman and Morrison pointed out that 5- and 10-second speech samples are equally suitable for rating the severity of articulatory defectiveness on a 1 to 9 scale.

Phonic training was indicated by Zedler as an important factor in increasing sound-discrimination ability. Schiefelbusch and Lindsey found that picture cards were useful in testing sound-discrimination ability.

CHAPTER III

PROCEDURE

This study was designed to compare elementary teachers not receiving speech instruction, elementary teachers receiving speech instruction, and speech clinicians in their ability to detect and refer children in need of speech therapy.

In the initial stages, it was necessary to meet with the primary and intermediate supervisors and the superintendent of the Ross Township Public Schools, Toledo, Ohio, to receive administrative sanction of the program of speech instruction. The procedure for the experiment was introduced first to the principals and then to the teachers.

Selection of Teachers

The proposed study was introduced verbally at staff meetings in the three elementary schools. During these meetings with school faculties, verbal emphasis was placed on the desirability of participation. This experimenter pointed out that the speech-instruction program was an opportunity for the participating teachers to grow professionally. It was explained that the knowledge gained would materially increase the teacher's effectiveness with children and be invaluable in the parental conferences which are required in the Ross Township Schools. Those teachers who expressed interest met with the investigator to plan meeting dates.

Subjects

The original experimental design called for eighteen teachers

and eighteen speech clinicians. The response of the teachers was great enough, however, to increase the size of each group to twenty.

The same twenty teachers served as subjects in both groups in the experiment. At the initial testing, they were elementary teachers not receiving speech instruction; at the final testing, they were elementary teachers who had received speech instruction. Their teaching experience ranged from one to twenty-two years. They all had normal hearing as tested with a Maico Pure Tone Audiometer, Model D-8. The youngest teacher was twenty-three years old and the oldest, fifty-five years of age. Thirty years was the median age.

Twenty speech clinicians also participated in this experiment. Eleven are currently employed by Columbus Public Schools; the remaining nine came from the Toledo Public Schools. These twenty clinicians did not attend any sessions on speech instruction. Their participation consisted of taking the Templin Short Test of Sound Discrimination, the test for degree of speech competence, and the referral test.

Their teaching experience ranged from one to nine years. They all had normal hearing as tested with a Maico Pure Tone Audiometer, Model D-8. The youngest clinician was twenty-two years old and the oldest, thirty-five years of age. Twenty-nine was the median age.

Materials

A tape recording containing the speech of fifty children was prepared. These children were enrolled at Arlington Park and Huy Schools, Columbus, Ohio, in grades one through six. Twenty-five were not enrolled in speech therapy; twenty-five were currently enrolled in speech therapy.

The speech recording included the words said by each child as he was naming the pictures in the Bryngelson-Glaspey Picture Articulation Test.[1] Each child was heard three different times; each sample was ten

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[1]Bryng Bryngelson and Esther Glaspey, Speech Improvement Cards, Chicago: Scott, Foresman and Co., 1954.

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seconds in length.

For demonstration purposes, tape recordings representing various levels of speech competency were played. These served as guides for each teacher and clinician when they were asked to rate numerically (from one to five) the speech of each sample. These samples were taken from a rating scale measuring the severity of articulation defectiveness.[2]

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[2]Sheila Morrison, "Measuring the Severity of Articulation Defectiveness", Journal of Speech and Hearing Disorders, Vol. 20: p. 347-351.

A master tape of the Templin Short Test of Sound-Discrimination[3]

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[3]Mildred C. Templin, "Study of Sound Discrimination Ability of Elementary School Pupils," Journal of Speech Disorders, Vol. 8, No. 2, p. 132.

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was obtained from the Listening Center of The Ohio State University.

Procedures for Evaluating the Recordings.

The twenty teachers were seated at tables in a quiet room of the

school building. Each was given an evaluation sheet with the following instructions:

> The recording, which will be played for your evaluation, contains 150 speech samples. If you think the child speaking needs speech therapy, underline "yes". If you think that speech therapy is not needed, underline "no". Finally make a judgment (1-5) on the speech competence and place the number in the blank.

This test took approximately thirty minutes. After a brief break, the Templin Short Test of Sound Discrimination was administered. The directions were simple; if the sounds were alike, they marked (S), if they sounded different, they marked (D).

The testing procedure was identical for the speech clinicians. Two clinicians were absent from the group meeting, however, so the experimenter tested them individually. One was tested in a quiet room of her home; the other in a quiet classroom.

The teachers evaluated the children's speech again after a three-week period. During the three-week period, the teachers received approximately four hours of speech instruction.

Equipment

An Uher tape recorder, Model Number Universal S, was used to make and play all the recordings for this experiment. The speech was $7\frac{1}{2}$ inches per second.

A Maico audiometer, Model D-8, was employed to test each subject's hearing ability. An air conduction, pure-tone sweep check at 15 db at 125 to 8000 cps was given to each subject participating in the experiment. They passed the test if they did not miss more than one frequency in each ear or two in one ear.

Procedure for the Instruction of the Experimental Group

After the first evaluation of the taped recording of the children's speech, the teachers attended four hours of instruction. The first hour was given the same day as the initial testing. A two-hour session was conducted one week later. The final hour of instruction preceded the retesting at the last meeting.

Speech-Instruction Program

The first meeting of the teachers was two-fold: (1) the initial testing session, (2) the first hour of speech instruction. The instruction began with a lecture on normal speech development, definition of a speech problem, and definition and etiology of articulatory problems. To demonstrate the various types of speech problems, recordings were played of (1) a stutterer's speech, (2) a hoarse voice, (3) a high-pitched voice, (4) the speech of a child with several sound substitutions and misarticulations, and (5) the speech of a child with one substitution. The hour ended with a general discussion of normal and non-normal speech found in the classroom.

The second meeting was devoted entirely to instruction. It began with a review of speech development and types of speech problems. Records of misarticulated speech were played. The larynx and its function were discussed; teachers received a mimeographed diagram for reference.

The remaining hour and a half was concerned with training in sound-discrimination. A mimeographed lesson plan for teaching sound

discrimination to children was distributed. As the plan was discussed, reference was made to the relationship between sound-discrimination ability and reading and spelling ability. Zedler's study on the relationship between written-spelling performance and sound-discrimination training was related in detail. The teachers agreed to teach the suggested lesson plan the following week.

Oral exercises to develop discriminative ability were given to the teachers. The material consisted of words which differed only in initial, medial, or final consonants. Answers were marked (S) same or (D) different on a mimeographed score sheet; they were immediately scored. Ways in which ear training could be improved were discussed. Finally, teachers were assigned to listen and score a seven-minute sound-discrimination exercise. The material was similar to what was done in class; it was taped and left on the tape recorders available at each elementary school.

The third meeting had two purposes: (1) to conclude the speech instruction program, (2) to retest the teachers. The instruction period began with a discussion of the sound-discrimination assignment. The exercise was scored; comments on its value were encouraged. Some time was also spent discussing the results of the sound-discrimination lesson taught to the children. The members of the group indicated that both assignments were of value.

Therapy for children with misarticulations was discussed. A mimeographed lesson plan was distributed to each teacher; it was suggested that she might adapt it to a child in her classroom needing help.

A mock articulation test was given to demonstrate the proper procedure. A mimeographed speech inventory form was given to each teacher. It was suggested that it be used to evaluate the speech needs of each classroom. At the conclusion of the instruction, the teachers were retested.

Summary

Twenty elementary teachers and twenty speech clinicians were selected for this study. A tape recording of the speech of twenty-five children enrolled in speech therapy and twenty-five children not enrolled in speech therapy was prepared according to the methods explained in the chapter. A master tape recording of the Templin Test of Sound-Discrimination was obtained from The Ohio State University. Subjects made judgments on referrals, levels of speech competency, and sound-discrimination. A program of speech instruction was administered to the teachers. At the conclusion of instruction, the teachers were retested.

CHAPTER IV

ANALYSIS OF DATA

Twenty elementary teachers and twenty speech clinicians participated in this experiment. Each subject was employed in a public-school system as a teacher or as a clinician. Each subject had normal hearing. The purpose of the experiment was to compare elementary teachers without speech instruction (Group I), elementary teachers with speech instruction (Group II), and speech clinicians (Group III), in their ability to select children in need of speech therapy, rate speech competency, and sound-discrimination ability.

The Hypotheses

The following hypotheses were tested:

1. There is no difference in the referral ability of subjects in Group I, Group II, and Group III.
2. There is no difference in sound-discrimination ability of subjects in Group I, Group II, and Group III.
3. There is no difference in the ability to rate speech competency of subjects in Group I, Group II, and Group III.
4. There is no relationship between scores given by subjects in Group I and Group II on referral, sound-discrimination, and rating ability.
5. There is no relationship between referral, sound-discrimination, and rating scores given by subjects in Group I.
6. There is no relationship between referral, sound-discrimi-

nation, and rating scores given by Group II.

7. Group I is independent of Group II in referral ability.

8. Group II is independent of Group III in referral ability.

9. Group III is independent of Group I in referral ability.

Hypothesis I. There is no difference in the referral ability of subjects in Group I, Group II, and Group III.

A. There is no significant difference between elementary teachers not receiving speech instruction (Group I) and elementary teachers receiving speech instruction (Group II) in their ability to select children for speech therapy. The hypothesis was tested by using the *t* test for correlated groups. The difference between the mean scores is a *t* value of 2.16, significant at the 5 per cent level. The hypothesis was rejected. There is a significant difference between elementary teachers not receiving speech instruction and elementary teachers receiving speech instruction in their ability to select children for speech therapy.

B. There is no significant difference between elementary teachers not receiving speech instruction (Group I) and speech clinicians (Group III) in their ability to select children for speech therapy. A *t* test for uncorrelated groups was computed. The result was a nonsignificant value of .6. The hypothesis cannot be rejected; there is no significant difference between elementary teachers not receiving speech instruction and speech clinicians in their ability to select children for speech therapy.

C. There is no significant difference between elementary

teachers receiving speech instruction (Group II) and speech clinicians (Group III) in their ability to select children for speech therapy. A *t* test for uncorrelated groups was computed. The result was a non-significant value of .22. The hypothesis cannot be rejected. There is no significant difference between elementary teachers receiving speech instruction and speech clinicians in their ability to select children for speech therapy.

Hypothesis II. There is no difference in the ability to rate speech competency of subjects in Group I, Group II, and Group III.

A. There is no significant difference between elementary teachers not receiving speech instruction (Group I) and elementary teachers receiving speech instruction (Group II) in their ability to rate speech competency. A *t* test for correlated groups was computed. The result was .0001, which is nonsignificant.

The *t* test was computed again; the standard deviation score was employed as the basic measure in comparing differences between the two groups. The result was a *t* of .387. Since this is also nonsignificant, the hypothesis cannot be rejected. There is no significant difference between elementary teachers not receiving speech instruction and elementary teachers receiving speech instruction in their ability to rate speech competency.

B. There is no significant difference between elementary teachers not receiving speech instruction (Group I) and speech clinicians (Group III) in their ability to rate speech competency. The hypothesis was tested by computing a *t* test for uncorrelated groups.

The resulting value was .19; this is not significant. Using the standard deviation score as the basic measure, the t test resulted in a value of .02. Since both scores are not significant, the hypothesis cannot be rejected. There is no significant difference between elementary teachers not receiving speech instruction and speech clinicians in their ability to rate speech competency.

C. There is no significant difference between elementary teachers receiving speech instruction (Group II) and speech clinicians (Group III) in their ability to rate speech competency. The hypothesis was tested by computing a t test for uncorrelated groups. The non-significant result was .001. When the t test was repeated using the standard deviation scores, the t value was shown to be .003. The hypothesis cannot be rejected. There is no significant difference between elementary teachers receiving speech instruction and speech clinicians in their ability to rate speech competency.

Hypothesis III. There is no difference in sound-discrimination ability of subjects in Group I, Group II, and Group III.

A. There is no significant difference between elementary teachers not receiving speech instruction (Group I) and elementary teachers receiving speech instruction (Group II) in sound-discrimination ability as measured by the Templin Short Test of Sound-Discrimination. The hypothesis was tested by computing a t test for correlated groups. The t value was .56; this is nonsignificant. Therefore, the hypothesis cannot be rejected. There is no significant difference between elementary teachers not receiving speech instruction and elementary

teachers receiving instruction in sound-discrimination ability.

B. There is no significant difference between elementary teachers not receiving speech instruction (Group I) and speech clinicians (Group III) in sound-discrimination ability as measured by the Templin Short Test of Sound-Discrimination. This hypothesis was tested by computing a t test for uncorrelated groups. The t value was a nonsignificant .3. The hypothesis cannot be rejected. There is no significant difference between elementary teachers not receiving speech instruction and speech clinicians in sound-discrimination ability.

C. There is no significant difference between elementary teachers receiving speech instruction (Group II) and speech clinicians (Group III) in their sound-discrimination ability as measured by the Templin Short Test of Sound-Discrimination. The hypothesis was tested by computing a t test for uncorrelated groups. The result was a t of .116, which is nonsignificant. The hypothesis cannot be rejected. There is no significant difference between elementary teachers receiving speech instruction and speech clinicians in sound-discrimination ability.

Hypothesis IV. There is no relationship between scores given by subjects in Group I and Group II on referral, sound-discrimination, and rating ability.

A. There is no relationship between teachers in Group I and teachers in Group II in selection of children for speech therapy. This hypothesis was tested with a Spearman-Rho correlation. The result

was a .56, significant at the 5 per cent level. The hypothesis was rejected. There is a significant relationship between teachers in (Group I) and teachers in (Group II) in selection of children for speech therapy.

B. There is no relationship between teachers in Group I and teachers in Group II in sound-discrimination ability. The hypothesis was tested with a Spearman-Rho correlation. The result was .85, significant at the 5 per cent level. The hypothesis was rejected. There is a significant relationship between teachers in Group I and teachers in Group II in sound-discrimination ability.

C. There is no relationship between teachers in Group I and teachers in Group II in ability to rate speech competency. This hypothesis was tested with a Spearman-Rho correlation. The result was .38, significant at the 1 per cent level. The hypothesis was rejected; there is a significant relationship between teachers in Group I and teachers in Group II in ability to rate speech competency.

Hypothesis V. There is no relationship between referral, sound-discrimination, and rating scores given by teachers without instruction (Group I).

A. There is no relationship between referrals and sound-discrimination scores of teachers in Group I. The Spearman-Rho correlation resulted in a score of .039, which is nonsignificant. The hypothesis cannot be rejected. There is no significant relationship between referral and sound-discrimination abilities of teachers

without instruction (Group I).

B. There is no relationship between sound-discrimination and rating scores of teachers in Group I. The Spearman-Rho correlation was .149, which is nonsignificant. The hypothesis cannot be rejected; the analysis has shown that there is no significant relationship between sound-discrimination and rating abilities of teachers without instruction (Group I).

C. There is no relationship between referrals and rating scores of teachers in Group I. The Spearman-Rho correlation gave a score of -.175, which is nonsignificant. The hypothesis cannot be rejected; there is no significant relationship between referral and rating abilities of teachers without instruction (Group I).

Hypothesis VI. There is no relationship between referral, sound-discrimination, and rating scores given by teachers with instruction (Group II).

A. There is no relationship between referral and sound-discrimination scores of teachers in Group II. The Spearman-Rho correlation resulted in a score of .45, significant at the 1 per cent level. The hypothesis is rejected; there is a significant relationship between referral and sound-discrimination scores of teachers in Group II.

B. There is no relationship between sound-discrimination and rating scores of teachers in Group II. The Spearman-Rho correlation was -.758, which is not significant. The hypothesis cannot be rejected; there is no significant relationship between sound-discrimination and

rating scores of teachers in Group II. The negative result implies that the high sound-discrimination scores generated the low rating scores.

C. There is no relationship between referrals and rating scores of teachers in Group II. The Spearman-Rho correlation resulted in a score of -.027, which is not significant. The hypothesis cannot be rejected; there is no significant relationship between referrals and rating scores of Group II.

Hypothesis VII. Group I is independent of Group II in referral scores. This hypothesis was tested with a Chi-Square (Table I). The result was 925.1, which is significant at the 1 per cent level. The hypothesis is rejected; Group I is not independent of Group II in referral scores.

Hypothesis VIII. Group II is independent of Group III in referral scores. The Chi-Square analysis yielded a significant score of 374.8. The hypothesis is rejected; Group II is not independent of Group III in referral scores. This is shown in Table II.

Hypothesis IX. Group I is independent of Group III in referral scores. The Chi-Square analysis yielded a score of 196.8, which is significant. The hypothesis is rejected; Group I is not independent of Group III in referral scores. This is shown in Table III.

Summary

In this chapter, the hypotheses of the experiment, the statistical tests utilized, and specific results were indicated. Appendix B contains the raw data and formulas employed in the analyses.

TABLE I

CONTINGENCY TABLE SHOWING RELATIONSHIP OF REFERRAL DECISIONS BETWEEN GROUP I (TEACHERS WITHOUT INSTRUCTION) AND GROUP II (TEACHERS WITH INSTRUCTION)

Experimental Groups	Referral Decisions		Total
	Yes	No	
Teachers without instruction (Group I)	457 (694.5)	543 (305.5)	1000
Teachers with instruction (Group II)	332 (94.5)	668 (905.5)	1000
Total	789	1211	2000

TABLE II

CONTINGENCY TABLE SHOWING RELATIONSHIP OF REFERRAL DECISIONS BETWEEN GROUP II (TEACHERS WITH INSTRUCTION AND GROUP III (SPEECH CLINICIANS)

Experimental Groups	Referral Decisions		Total
	Yes	No	
Teachers with Instruction (Group II)	457 (610)	543 (390)	1000
Speech Clinicians (Group III)	763 (610)	237 (390)	1000
Total	1220	780	2000

$X^2 = 196.98$
$(X^2_{.01} = 10.83)$

TABLE III

CONTINGENCY TABLE SHOWING RELATIONSHIP OF REFERRAL DECISIONS BETWEEN GROUP I (TEACHERS WITHOUT INSTRUCTION) AND GROUP III (SPEECH CLINICIANS)

Experimental Groups	Referral Decisions		Total
	Yes	No	
Teachers without Instruction (Group I)	332 (547.5)	668 (452.5)	1000
Speech Clinicians (Group III)	763 (547.5)	237 (452.5)	1000
Total	1095	905	2000

$X^2 = 374.88$
$(X^2_{.01} = 10.83)$

CHAPTER V

SUMMARY AND CONCLUSIONS

The major concerns of this study were to determine (1) differences in ability to make referrals, (2) differences in ability to rate speech competency, and (3) differences in sound-discrimination ability. These measures were obtained for teachers not receiving speech instruction (Group I), teachers receiving speech instruction (Group II), and speech clinicians (Group III).

The following hypothesis were tested:

(1) There is no difference in the referral ability of subjects in Group I, Group II, and Group III.

(2) There is no difference in the ability to rate speech competency of subjects in Group I, Group II, and Group III.

(3) There is no difference in sound-discrimination ability of subjects in Group I, Group II, and Group III.

(4) There is no relationship between scores given by subjects in Group I and Group II on referral, sound-discrimination, and rating ability.

(5) There is no relationship between referral, sound-discrimination, and rating scores given by subjects in Group I.

(6) There is no relationship between referral, sound-discrimination, and rating scores given in Group II.

(7) Group I is independent of Group II in referral decisions.

(8) Group II is independent of Group III in referral decisions.

(9) Group III is independent on Group I in referral decisions.

According to the analysis of the data, certain factors were significant:

(1) There was a significant difference (5 per cent level) in referral ability between teachers without instruction (Group I) and teachers with instruction (Group II). A score of 2.16 was obtained from the t test for related measures.

(2) There was a significant correlation (5 per cent level) in referral ability between teachers without instruction (Group I) and teachers with instruction (Group II). A score of .56 was obtained from the Spearman-Rho correlation.

(3) There was a significant correlation (5 per cent level) in sound-discrimination ability between teachers without instruction (Group I) and teachers with instruction (Group II). A score of .85 was obtained from the Spearman-Rho correlation.

(4) There was a significant correlation (1 per cent level) in rating ability between teachers without instruction (Group I) and teachers with instruction (Group II). A score of .38 was obtained from the Spearman-Rho correlation.

(5) There was a significant correlation (1 per cent level) between referral ability and sound-discrimination ability

for teachers with instruction (Group II). A score of .45 was obtained from the Spearman-Rho correlation.

(6) There was no significant difference in referral decisions between teachers with instruction (Group II) and speech clinicians (Group III).

Conclusions

From the analysis of the data reported and summarized above, several conclusions may be drawn:

(1) A speech-instruction program is an effective method of increasing the referral ability of classroom teachers.

(2) Training in sound discrimination is correlated with the teachers' selection of children for speech therapy.

Implications and Recommendations

Implications. Objective evidence presented in this experiment indicated that a program of speech instruction probably is an effective method of increasing efficiency of teacher referrals. From the results of this study, certain implications may be made. School administrators who have been concerned with the problem of extending the services of their speech clinician could utilize the speech-instruction program as a partial solution to their problem.

An avowed purpose of education is to help children develop into useful citizens. Many of the social and emotional barriers to effective communication may be reduced or removed by the regular classroom teacher if she has a functional knowledge of speech skills. The speech-instruction program is one way in which these skills may be

given to the teacher.

Educational leaders are convinced that the self-contained classroom is the most profitable method of pupil instruction. A speech-instruction program enables the teacher to integrate speech skills into regular class work. A high degree of integration between class and speech activities is also very desirable from the clinicians' point of view.

Recommendations

1. The speech instruction program should:
    a. include training in sound discrimination,
    b. provide ample opportunity to discuss individual children,
    c. include phonetics to increase the awareness for differences among sounds.
2. Further research should include a study of:
    a. the effect of an inservice speech-training program on reading skills at the primary level,
    b. the effect of a sound-discrimination program on referral ability,
    c. the effect of a phonetics program on referral ability.

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APPENDIX A

LESSON PLAN I

I. Objectives:
- A. To explain normal speech development.
- B. To explain what is meant by a speech problem.
- C. To present the incidence of children with speech problems in the schools.
- D. To define what is meant by an articulatory problem.
- E. To enumerate the causes of articulatory problems.

II. Procedures:
- A. Discuss developmental outline of the process of acquiring speech.
  1. Reflexive vocalization.
  2. Babbling.
  3. Lalling.
  4. Echolalia.
  5. True speech.
  6. First words.
  7. Vocabulary growth and development.
- B. Give definition of speech problem.
  1. Speech is inadequate when it is
     a. not easily audible.
     b. not readily intelligible.
     c. vocally unpleasant.
     d. deviated in respect to specific sound production.
     e. labored in production, lacks conventional rhythm, stress, tonal quality, or pitch change.
     f. linguistically deficient.
     g. inappropriate to the speaker as in age, sex, or physical development.
     h. visibly unpleasant.
  2. A speech problem is not
     a. improper grammar.
     b. incorrect pronunciation.
     c. substandard ability to read.
     d. lack of preparation for class recitation.
     e. types of personality maladjustment.
     f. mental subnormality.
- C. Present statistics.
  1. 2,000,000 children or 5 per cent of school population.
  2. Four types of speech problems:
     a. Defects of articulation, 70-85%.
     b. Defects of voice.
     c. Defects of rhythm.
     d. Defects of dysfunctions.
  3. More boys than girls.

D. Define articulatory problem.
   1. Deviates in respect to specific sound production.
   2. Types:
      a. Substitution.
      b. Addition.
      c. Omission.
      d. Distortion.

E. Discuss causes of speech problems.
   1. Cleft palate.
   2. Cerebral palsy.
   3. Hearing loss.
   4. Dental abnormalities.
   5. Oral structure and coordination.
   6. Faulty learning due to:
      a. Poor speech models.
      b. Lack of stimulation and motivation.
   7. Emotional maladjustment.
   8. Intelligence.

III. Assignment: Observe and determine how many children like to talk in your room and how many are holding back. Notice the quiet child and try to find out some facts that contribute to his behavior.

IV: Materials: Mimeographed sheets of:
   1. The Speech Teacher, "Why Teach Speech in the Elementary Schools?" John J. Pruis, January, 1952.
   2. Guides to Speech Training in the Elementary School, National Association of Teachers of Speech, Part I.

NORMAL SPEECH DEVELOPMENT

Reflexive Vocalization: First two or three weeks.
At first, crying is an expression in response to stimuli within and around the baby. Sounds are produced without purpose and lack meaning. After this period, differences are noted in the cry and the child's physical needs are announced by these differences. However, the child is not aware of the differences.

Babbling: About six or seven weeks of age.
The child becomes aware of the sounds that he is making. Vowels may appear before consonants but there is no predetermined order of appearance of sounds. This period may be considered a training or preparatory period for later articulate utterance.

Lalling: About six months of age.
At this stage children repeat heard sounds or sound combinations. Having learned to imitate his own sounds, the child is more ready to imitate sounds he will hear other people produce.

Echolalia: About nine or ten months of age.
The child may be heard imitating the sounds which others have made. He is building up the sounds which will be needed for speaking his own language.

True Speech: Somewhere between twelve and eighteen months of age.
True speech means that the child uses words and that he expects a response to what he is saying. Before this stage the child must understand the speech of others in his environment.

First Words: These are usually monosyllables or duplicated disyllables such as ma, mama, pa, papa. Words may be used to express complete thoughts. For example, "da" may mean "Give me my doll," or "Look at the doll," or any other number of possible contexts.

Vocabulary Growth and Development: Words occur in the following order: Nouns, verbs, adjectives, adverbs, pronouns, articles, prepositions, conjunctions. From the very beginning interjections form a very large part of the child's vocabulary. As the child grows older interjections and nouns decrease in number.

Age one year: oral vocabulary of one to three words.
Age two years: number of words close to 300.
Age three years: number of words almost 900.

AGE OF ARTICULATORY EFFICIENCY OF 23 CONSONANT SOUNDS*

Age: By 3½ years (b) (p) (w) (h)

4½ years (d) (t) (n) (g) (k) (ng-) (y-j)

5½ years (f)

6½ years (v) (th-) (zh-) (sh-) (l)

7½ years (s) (z) (r) (th-) (wh-hw) (d) (t)

*Irene Poole, "Genetic Development of Articulation of Consonant Sounds in Speech," Elementary English Review, II (1934), 159-61.

DEFINITION OF SPEECH DEFECTS

Speech is defective when it deviates so far from the speech of other people to cause the listener to pay more attention to how the speaker says something rather than what he says, when it interferes with communication, or causes the possessor to be maladjusted.

The above results from speech that is

1. not easily audible,
2. not readily intelligible,
3. vocally unpleasant,
4. deviated in respect to specific sound production,
5. labored in production, lacks conventional rhythm, stress, tonal quality, or pitch change,
6. linguistically deficient,
7. inappropriate to the speaker as to age, sex, or physical development,
8. visibly unpleasant.

A speech defect is not

1. improper grammar,
2. incorrect pronunciation,
3. substandard ability to read,
4. lack of preparation for class recitation,
5. types of personality maladjustment,
6. mental subnormality.

CAUSES OF SPEECH DEFECTS

1. Cleft palate.
2. Cerebral palsy.
3. Hearing.
4. Dental abnormalities.
5. Oral structure and coordination.
6. Faulty learning due to:
   a. Poor speech models.
   b. Lack of stimulation and motivation.
7. Emotional maladjustment.
8. Intelligence.

THE ENGLISH SPEECH SOUNDS

Classification	General Movement	Symbols Whispered	Symbols Voiced
I. Plosives breath stream blocked, pressure built up	1. Closure of lips	p	b
	2. Tongue tip at upper tooth-gum ridge	t	d
	3. Back of tongue in contact with soft palate	k	g
II. Fricatives breath stream partially blocked, breath passes through small opening to make friction noise	1. Lower lip in contact with upper teeth	f	v
	2. Tongue tip protruding slightly in contact with upper teeth		
	3. Sides of tongue in contact with upper teeth and alveolar ridge, breath stream down narrow central groove of tongue and over cutting edge of one of the lower incisors	s	z
	4. Movement similar to s and z central groove wider		
III. Affricates combination of one plosive and one fricative			
IV. Nasals breath stream restricted in the oral cavity, unrestricted in nasal cavity	1. Restriction by closure of lips		m
	2. Restriction by tongue tip at upper tooth gum ridge		n

Classification	General Movement	Symbols Whispered	Symbols Voiced
IV. Nasals	3. Restriction by back of tongue in contact with soft palate		
V. Aspirate no restriction, breath stream through mouth	1. Movement toward the vowels that follow	h	
VI. Glides transition sounds, vowel like in character	1. as in <u>y</u>ou 2. as in <u>w</u>on 3. as in <u>r</u>ed 4. as in <u>l</u>amp		
VII. Combination of aspirate h and glide w			
VIII. Blends Combination of consonant sounds			

If you will take a mirror and look into your own mouth in a good light, you will be able to see how many of the speech sounds are shaped by the movements of parts of the mouth. You can feel these mouth movements as they form positions in the front or the middle or the back of the mouth.

LIPS Watch both lips as they form the m, b, p, w, and wh, in: me, boy, pie, walk, and white.

Watch the lower lip move up against the cutting edges of the upper front teeth, as you say the f, and v, in four, five, and give.

Watch the lips change their positions as you say the sounds oo, aw, and o, in the words moon, book, ball, and box.

TEETH Watch the lower front teeth help the upper front teeth to make a narrow slit for the tip of the tongue, as you begin the words think, this.

TONGUE You can see and feel the front of the tongue rise to press against the gum ridge above the upper front teeth, as you make the n, d, t, and l sounds in any, aid, hot and almost.

See the front of the tongue rise to push against the upper gum above the front teeth, and feel the tip of it pull down and stiffen, to form a sharp small groove for the breath, as you say the s and z sounds in the words husk and buzz.

Feel the tip of the tongue pull down still more, to make a larger breath groove, and watch the mouth corners pull firmly toward each other, as you make the sh in ocean and the zh in pleasure.

Feel the tip of the tongue push against the upper gum, to make the t at the beginning of the ch sound in chicken. Feel the tip of the tongue make the d at the beginning of the j sound in jelly.

Watch and feel the front of the tongue curve up, free in the middle of the mouth, as you form the r in the word are.

Feel the back of the tongue rise to meet the contracting soft palate, as you say the k, g, and ng, at the end of the words pack, egg, and wing.

Watch the tongue change its position as you change the beginning sound from word to word in arm, each, uncle, egg, and, it, yes.

LESSON PLAN II

PART A

I. Objectives:
- A. To explain what is meant by defective speech.
- B. To describe and explain the various types of defects so that the classroom teacher will be more aware of speech problems.
- C. To describe the nature of speech.

II. Procedures:
- A. Conduct a short discussion about the previous assignment. (Keep a record of the number they report for future reference)
- B. Discuss and explain the various types of defects. (Most of the time will be spent on this objective)
  1. Imitate the various defects.
  2. Play records.

  (Spend most of the time on functional defects)
- C. Explain the nature of speech. (About 5 to 10 minutes)
  1. Have the teachers stand (it will be a rest)
     a. Explain respiration and practice.
     Put hands against lower ribs with fingers touching in front.
     Breathe and feel the inward and outward movement.
     Take air in --- ribs move out, chest up.
     Push air out --- ribs move in, chest down.

     Put one hand flat against the triangle formed by the ribs in front and keep one hand on the lower ribs. Breathe.
     Front pulls in --- ribs move out.
     Front expands --- ribs move in.
     The action is the opposite. Breathing uses many muscles and requires good coordination. (Some cerebral palsy children have poor rhythm due to lack of coordination of muscles for breathing)
  2. Point to the larynx and approximate position of the vocal cords behind the "Adams Apple". (Vocal cords are not like strings, they are flaps that vibrate in part of whole.)
  3. Show pictures of the larynx.
- D. Inform the teachers about the development of speech.
  1. Refer to the chart on the sheets.

III. Assignment: Observe and determine how many children have speech problems in your room. If possible, determine the type.

IV. Materials:
1. Mimeographed sheets that were prepared for the teacher.
2. Review the standard speech texts - C. Van Riper, Johnson, West-Kennedy-Carr, Ainsworth, Berry-Eisonson, Bender-Kleinfield, Backus, etc.
3. Records of types of speech.

Analysis of the child's speech

The first step is to determine which speech sounds the child makes incorrectly. Consonants and consonant combinations cause the most trouble. For the child who can read, use simple sentences containing words in which a particular sound occurs, preferably in the three positions: initial, medial, and final (as in sun, Easter and bus). For the child who cannot read, you may use carefully chosen pictures or objects to bring out the desired response, or you may ask the child to repeat words or sentences after you.

Below are listed the twenty-five consonants and combinations of English which you will test in your speech analysis. You will notice that some of the sounds are grouped. The sounds within each group are made with similar tongue, lip, and jaw movements. Where there are three sounds in a group, the first one is voiceless, the second sound is voiced, and the third one is voiced and the sound is directed through the nose. Where there are two sounds in a group, the first one is voiceless and the second one is voiced.

The sounds are listed in an order which gives some regard to the difficulty children have with them. You may use this as a general guide to the order in which you should teach the sounds.

You will find opposite each group of sounds a simple test sentence for each sound. These may serve as a guide to you in developing sentences of your own which may be better suited to your needs.

The Consonants and Combinations with Test Sentences

1. p-b-m	Poor papa stepped on the top. Bring the rubber tub for baby. Mama met Tom in the warm room.
2. wh-w	Is the white bear anywhere around? Willie went away to school.
3. t-d-n	Tommy's bat was better. Daddy will spade the garden today. Nanny spent a penny for a candy cane.
4. h	Harry is hiding behind the house.
5. y	Were you here yesterday William?
6. k-g-ng	He asked who was taking the car to the lake. Give the dog his bone again. Thank you for coming to the meeting.

7. f-v	The fluffy cat fell off the fence. I have seven very heavy calves.
8. th (voiceless) th (voiced)	I think both boys will have something to do. This is a smooth leather belt.
9. l	Lillie learned to spell from the yellow spelling book.
10. r	Robert and Harry are over there.
11. s-z	Sammy was passing across the street. Hear the buzzing of the bees in the zoo.
12. sh-zh (azure)	She did not wish to do the washing. It was a pleasure to play in the garage.
13. ch-j	The children like their teacher very much. George is changing the page for Ginger.

Teaching the [p] sound

I. Goal: To develop the clear production of the [p] sound. (Common Errors: Indistinctness and omissions of sound in the final position.)

II. Paths to goal:

A. Relaxation: quiet music or quiet poetry read in quiet, clear voice.

B. Presentation of the sound: Imitation of motor boat ... puffing sound. (this sound is made with a puff of breath between the lips, a quick, quiet puff.)

1. Practice with group on puffing paper windmills across table with [p] sound.
2. Let them listen for [p] sound in words or poem which you read.

Song of the Pop Corn

"Pop-pop-pop!"
Says the popcorn in the pan.
"Pop-pop-pop!
You may catch me if you can!"

May read again and have children say the refrain--
"Pop-Pop-Pop"
The teacher should listen for final [p] sounds.

3. Assuming that some cannot say the sound or omit it.....

a. Combine sound [p] into one-syllable word which can be used frequently in meaningful situation:

Build around store idea: "I pay you"

Start with "p-ay" first and build up if necessary and add as can.

b. When can get "pay" easily, may add these words.... one at a time in meaningful situations

put	pass	keep
pack	pick	up

c. For speech book:

pan	paper	park	party	peach	pen
pencil	puppy	people	piano	pie	pig
pipe					

(Each teacher received a copy of this lesson plan.)

Teacher's Inventory of Speech Needs

Name of School _____ Location of School _____

Teacher's Name _____ Grade Taught _____ No. in Class _____ Boys _____ Girls _____

A. Estimated Nature of Pupil Needs, as Noted in Classroom School Life	Put names of Students Here				
	1	2	3	4	5
1. Can hardly be understood					
2. Omits certain sounds in speaking					
3. Uses "baby talk", substituting wrong sounds for right ones.					
4. Has a foreign accent					
5. Has a nervous, jerky way of speaking					
6. Has unusually slovenly speech					
7. Stutters, repeating initial sounds, syllables, words					
8. Blocks, sometimes being unable to get words out					
9. Has a hoarse, husky voice					
10. Talks in a monotone					
11. Has a exceedingly nasal voice					
12. Has an habitually high-pitched voice					
13. Has an habitually low, guttural voice					
14. Has an habitually weak voice, so can hardly be heard					
15. Has something the matter with the voice which I cannot describe					
16. Has nervous mannerisms when speaking					
17. Avoids speech rather consistently					
18. Seems to have some loss of hearing					
19. Pupil named in this column is also a poor reader					
20. For other reasons than the above, I would like to have these ----- pupils checked					

LESSON PLAN II

PART B

I. Objectives:
- A. To demonstrate how children are taught to discriminate between sounds.
- B. To improve the sound discrimination ability of the teachers.

II. Procedure:
- A. Gross sound discrimination.
  1. Produce sounds of
     - a. wood blocks
     - b. drum
     - c. bell
     - d. piano, etc.
  2. Have children hide eyes; as each sound is made, or hand is raised. Paper cut-outs of the object may also be used by the children to show when a particular sound is made.
- B. Intensity discrimination
  1. Make 2 sounds for each object, but make one louder.
  2. Ask for response for the louder tone.
- C. Listening
  1. Have children put heads on table or desk, and
  2. Listen to all sounds or noises, and
  3. Talk about what they hear
     (Teacher may add to the noises by tapping of pencil, closing door, walking, etc.)
- D. Speech sound discrimination
  1. Tell me which sounds are the same (may raise hands when 2 sounds sound alike)

te - te	ne - ne	ej - ech
the - the	pe - ke	eth - eth
ze - je	ov - ov	en - eng

- E. Discussion of the "Tommy Stories" utilized in Zedler's sound discrimination experiment.
- F. Oral exercises to develop discriminative ability. Use pages 51-6, in Fairbank's, Voice and Articulation Drillbook. These selected exercises contain words which differ only in the initial, medial, or final consonant. Teachers mark each pair of words with S (same) or D (different) on a numbered score sheet.

III. Assignment:
- A. To listen and score a seven-minute sound discrimination exercise.
  1. There were two tape recorders available in each of the three elementary schools. A sound-discrimination exercise was taped and left with each recorder. This material came from Fairbanks and was similar to what we did in class. Score sheets were also left with the recorder.
- B. To utilize some discrimination exercises in the classroom. A suggested plan was given to each teacher to facilitate this task.

Sound Discrimination Plan

I. Goal: To demonstrate how children are taught to discriminate between sounds.

II. Paths to the Goal:

A. Gross sound discrimination

1. Produce sounds of
   a. wood blocks
   b. drum
   c. bell
   d. piano, etc.
2. Have children hide eyes; as each sound is made, or hand is raised. Paper cut-outs of the object may also be used by the children to show when a particular sound is made.

B. Intensity discrimination

1. Make 2 sounds for each object, but make one louder.
2. Ask for response for the louder tone.

C. Listening

1. Have children put heads on table or desk, and
2. Listen to all sounds or noises, and
3. Talk about what they hear
   (Teacher may add to the noises by tapping of pencil, closing door, walking, etc.)

D. Speech sound discrimination

1. Tell me which sounds are the same (may raise hands when 2 sounds sound alike)

te - te	ne - ne	ej - ech
the - the	pe - ke	eth - eth
ze - je	ov - ov	en - eng

(Copies of this lesson plan were distributed to the teachers.)

Zedler, Empress Young, "Effect of Phonic Training on Speech Sound Discrimination and Spelling Performances," Journal of Speech and Hearing Disorders, 21: June, 1956.

The specific aims of the phonic training, as given to the pupils in this study, were

(a) to develop awareness of sounds in words to the extent that the pupils could recognize and discriminate the initial, medial, and final sounds by listening for certain sounds in certain places within the word

(b) to associate these sounds with appropriate letter symbols

(c) to accomplish these aims without losing the unity of the word in meaningful context. The 'Tommy Stories' were designed to fulfill these aims.

In each of 37 stories, the little boy Tommy learns about a speech sound or a group of closely related speech sounds in the following manner:

(a) he identifies the sound with a familiar environmental experience

(b) he discovers the manner and place of producing the sound with his own vocal mechanism

(c) he analyzes the sound out of words within the structure of sentences which he hears

(d) he discovers by listening that the sound may occur in different positions within words

(e) he associates the sound with its appropriate visual symbol or symbols written for him in upper and lower cases manuscript

by an adult in his environment.

Teaching of the 'Tommy Stories' comprised the method of phonic training used in this study.

For future reference, a summary of the educational implications of the study was prepared for the teachers.

On the basis of the evidence presented in this study, it seems reasonable to draw the following educational implications concerning the importance of phonic training:

1. Since written spelling performance has changed favorably after training in phonics, phonic training might be incorporated profitably into the teaching of the regular spelling lesson.
2. Since there was a significant negative correlation between pretest and gain scores in written spelling for the experimental group and not for the control group, phonic training may be a particularly suitable tool for use in improving the performance of pupils who spell poorly.
3. Since speech-sound discrimination plays an important part in many aspects of learning, and since the results of this study show that phonic training improves speech-sound discrimination, regular training in phonics probably would influence favorably all aspects of learning in which speech-sound discrimination is included, such as reading readiness, independent word attack, and speech correction.
4. Since written spelling performance and speech-sound discrimination are positively correlated regardless of special training in phonics, pupils probably use speech-sound discrimination to help them learn to spell whether they have been trained to do so or not.

(Copies of this critique were distributed to each teacher.)

LESSON PLAN III

I. Objectives:
   A. To outline a plan of therapy for children with articulatory problems.
   B. To demonstrate methods used in therapy.
   C. To demonstrate the administration of the articulatory test.

II. Procedures:
   A. Explain how therapist decides which sound should be worked on first.
      1. The sound which makes the speech most unintelligible.
      2. The sound that is expected for the child's age.
   B. Show how new sound is introduced to child.
   C. Sequence that sound is used to finally develop it in conversation.
   D. Show materials that can be used at the various stages mentioned in C.
   E. Explain the method of administering an articulation test.
      1. Administer a mock articulation test.

III. Assignment: Make an inventory of your class. Determine which sounds the children cannot make correctly.

IV. Materials: Mimeographed copies of "The Role of the Classroom Teacher in the Speech Correction Program."

Bryngelson and Glaspey, Speech Improvement cards. Also, an original collection of pictures made into an articulation test.

THERAPY PLAN FOR CHILDREN WITH ARTICULATION DISORDERS

1. The child must be made aware of his difficulty.
2. Eliminate causes, if still existing.
    A. Organic abnormalities.
        1. Surgery or orthodontia.
        2. Compensatory movements.
    B. Functional.
        1. Remove pressures.
        2. Improve auditory memory span.
        3. Tongue exercises.
3. Break down old sound with ear training.
    A. Isolation.
    B. Stimulation.
    C. Identification.
    D. Discrimination.
4. Sound must be learned in isolation.
    A. Stimulation.
    B. Phonetic placement.
5. The correct sound must be strengthened.
    A. Nonsense syllables.
    B. Babbling.
    C. Say and write it.
6. Sound must be incorporated into familiar words.
    A. Signal practice. (repeat sounds and say rest of word at a signal)

B. Name pictures.

7. Sound must be made habitual.

A. Negative practice.

B. Practice situations.

C. "Good speech chair."

D. Singing

E. Telling stories about pictures.

F. Oral reading.

G. Conversations.

H. Radio speaking.

I. Group discussion.

J. Choral speaking.

8. Lesson periods should be brief.

A. Fifteen minutes two times a week.

9. Things to remember.

A. Don't correct every error.

B. Use only a few words at a time.

C. Only one situation at a time.

D. Progress is slow.

THE ROLE OF THE CLASSROOM TEACHER IN THE SPEECH CORRECTION PROGRAM

"Without intelligent and wholehearted assistance of the informed classroom teacher the special teacher cannot be greatly effective."

1. Report any child with a speech problem who has been overlooked in the survey. Report any child who appears to be hard of hearing. The classroom teacher with training in speech correction may conduct the initial survey if the specialist is willing.

2. Provide opportunities for the child to recite orally. May help in carrying out prescribed treatment.

3. May co-ordinate speech training with other courses in the curriculum. May invite specialist to observe oral activities in the classroom and comment on the voice and diction of all the children as well as the clinical cases.

4. May create an interest in the child to want to go to speech clinic.

5. May be able to furnish speech clinician with valuable information about child and his needs.

6. May report regularly and specifically on speech progress of children treated in the clinic.

7. If or when you have had a course "Speech Correction for the Classroom Teacher" you may safely handle the minor articulatory cases.

Bulletin Board

1. Mottoes for Classroom Teachers to use on Bulletin Board or Blackboard

   Think before you talk.

   Stand tall when you talk.

   Start the day with good speech.

   Do I speak too fast?

   Do I speak too slowly?

   Do I speak plainly?

   Do I speak so everyone can hear me?

   Do I open my mouth when I talk?

   Do I use a friendly voice?

11. Arrangement and selection of pictures for bulletin board for following two purposes:

    1. Stimulate talking.

    2. Furnish topics for discussion.

SPEECH REFERENCES FOR CLASSROOM TEACHER

I. The Teacher's Speech:

Anderson, V., The Speaking Voice. New York: Oxford University Press, 1942.

Fairbanks, Grant, Practical Voice Practice. New York: Harper and Brothers Company, 1944.

Manser, Ruth B. and L. Finlan, The Speaking Voice. New York: Longmans, Green and Company, 1950.

Mulgrave, Dorothy I., Speech for the Classroom Teacher. New York: Prentice-Hall, Incorporated, 1946.

Sorrenson, Fred S., Speech for the Teacher. New York: Ronald Press, 1952.

II. Survey of Speech Problems:

Backus, Ollie L., Speech in Education: A Guide for the Classroom Teacher. New York: Longmans, Green and Company, 1943.

Johnson, W. (editor), Speech Problems of Children. New York: Grune and Stratton, Incorporated, 1950.

Rasmussen, Carrie, Speech Methods in the Elementary School. New York: Ronald Press, 1949.

Werner, Lorna S., Speech in the Elementary School. Evanston, Illinois: Row, Peterson and Company, 1947.

III. Techniques for Teaching Speech:

Lloyd, Pearl M., Our First Speech Book. New York: Newson and Company, 1942.

Scott, Louis Binder, Talking Time. St. Louis: Webster Publishing Company, 1951.

APPENDIX B

REFERRAL SCORES

	GROUP I	GROUP II	GROUP III
1.	98	133	112
2.	101	110	141
3.	112	119	143
4.	90	122	106
5.	74	101	110
6.	101	92	118
7.	132	135	143
8.	111	101	114
9.	75	92	115
10.	114	106	138
11.	110	110	98
12.	92	93	132
13.	90	113	109
14.	141	138	93
15.	79	100	144
16.	101	98	142
17.	98	141	100
18.	114	120	149
19.	53	90	111
20.	110	114	103
Σ	1996	2228	2421
Σ^2	206998	235168	299437
$M\Sigma$	99.8	111.4	121.05
$M\Sigma^2$	10349.4	12658.4	14971.85

SOUND-DISCRIMINATION SCORES

	GROUP I	GROUP II	GROUP III
1.	51	60	53
2.	48	50	59
3.	32	48	68
4.	68	64	48
5.	61	61	63
6.	53	56	67
7.	50	48	49
8.	48	61	43
9.	33	49	40
10.	48	51	49
11.	49	50	56
12.	42	40	59
13.	59	63	69
14.	61	64	52
15.	54	59	54
16.	46	45	59
17.	63	63	64
18.	50	52	67
19.	38	48	42
20.	41	49	63
Σ	995	1081	1124
Σ^2	51273	59433	64724
$M\Sigma$	49.8	54.1	56.2
$M\Sigma^2$	2563.7	2971.7	3236.2

NUMERICAL RATING SCORES

	GROUP I	GROUP II	GROUP III
1.	130	114	163
2.	163	172	106
3.	78	103	111
4.	122	131	106
5.	114	123	101
6.	162	111	184
7.	109	196	114
8.	169	100	206
9.	117	183	119
10.	75	106	202
11.	103	196	116
12.	84	139	153
13.	118	128	117
14.	103	125	129
15.	103	161	174
16.	140	150	174
17.	133	114	110
18.	103	109	119
19.	107	111	182
20.	139	144	130
Σ	2372	2716	2785
Σ^2	294908	387042	410021
$M\Sigma$	118.6	135.8	139.3
$M\Sigma^2$	14745.4	19352.1	20501.1

MEANS OF
NUMERICAL RATING SCORES

	GROUP I	GROUP II	GROUP III
1.	2.6	2.3	3.3
2.	3.3	3.4	2.1
3.	1.6	2.1	2.2
4.	2.4	2.6	2.1
5.	2.3	2.5	2.1
6.	3.3	2.2	3.7
7.	2.2	3.9	2.3
8.	3.4	2.0	4.1
9.	2.3	3.7	2.4
10.	1.5	2.1	4.0
11.	2.1	3.9	2.3
12.	1.7	2.8	3.1
13.	2.4	2.6	2.3
14.	2.1	2.5	2.6
15.	2.1	3.2	3.5
16.	2.8	3.0	2.2
17.	2.7	2.3	2.9
18.	2.1	2.2	2.4
19.	2.1	2.2	3.6
20.	2.8	2.9	2.6
Σ	45.7	54.4	55.8
Σ^2	1153.5	1551.0	1644.4
$M\Sigma$	2.3	2.7	2.8
$M\Sigma^2$	57.7	57.6	82.2

FORMULAS UTILIZED IN THE STATISTICAL ANALYSES OF THE STUDY

t test for related measures[1]:

$$t = \frac{M_o - M_h}{\sqrt{n \frac{2d^2}{(n-1)}}}$$

---

[1]E. F. Lindquist, Statistical Analysis in Educational Research. Boston: Houghton Mifflin Co., 1940, p. 59.

---

t test for unrelated measures[2]:

$$t = \frac{\bar{X} - \bar{Y}}{\sqrt{\left(\frac{\Sigma x^2 + \Sigma y^2}{nx + ny - 2}\right)\left(\frac{Nx + Ny}{nx \cdot ny}\right)}}$$

---

[2]G. Milton Smith, A Simplified Guide to Statistics. New York: Holt, Rinehart and Winston, Inc., 1962, p. 89.

Chi-Square test for independence[3]:

$$X^2 = \Sigma \frac{(f_o - f_t)^2}{f_t}$$

---

[3]Ibid., p. 122.

Spearman-Rho correlation[4]:

$$r = 1 - \frac{6 \quad 2d^2}{\left(N^3 - N\right)}$$

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[4]Sidney Siegel, Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill Book Company, Inc., 1956, p. 204.

APPENDIX C

TEMPLIN SHORT TEST OF SOUND DISCRIMINATION[5]

A	B	C
1. te-te	1. ne-ne	1. fe-θe
2. hwe-we	2. dʒe-tʃe	2. va-ð
3. ne-me	3. ʃe-tʃe	3. zo-zo
4. ðe-de	4. im-in	4. ʃe-ʒe
5. fi-vi	5. hwi-wi	5. fi-θi
6. he-pe	6. ge-ge	6. ze-se
7. se-ze	7. dʒi-tʃi	7. mai-nai
8. θa-θa	8. fai-fai	8. θe-θa
9. ʒe-dʒe	9. e-ve	9. he-he
10. vo-bo	10. pe-pe	10. dʒi-ʒi

D	E	F
1. pe-ke	1. eʒ-edʒ	1. ʒe-ev
2. tʃo-ʃo	2. ov-ob	2. et-ep
3. ki-ti	3. ed-ed	3. ep-ep
4. eb-eb	4. em-eu	4. of-oθ
5. ehwe-ewe	5. edʒ-et	5. ov-oð
6. en-em	6. eʃ-etʃ	6. ed-sg
7. e-ed	7. imi-ini	7. idʒ-iʒ
8. ihwi-iwi	8. eð-az	8. ep-ek
9. ov-ov	9. eg-eg	9. airai-aiwai
10. eθ-eθ	10. is-iz	10. eʃ-eʒ

G
1. if-iθ
2. aim-ain
3. eθ-eθ
4. imi-ini
5. ef-ep
66. eð-eð
7. idʒ-iʒ
8. ep-ek
9. otʃ-oʃ
10. ez-eb

Key: All D except:
A. 1, 8
B. 1, 6, 8, 10
C. 3, 6, 8, 9
D. 4, 9, 10
E. 3, 4, 9
F. 3, 7
G. 3, 6

---

[5] Mildred C. Templin, "Study of Sound-Discrimination Ability of Elementary School Pupils," Journal of Speech Disorders, Vol. 8, No. 2 (1943), p. 132.

Speech 504 (Exercise 12, Speech 417)

TEMPLIN SHORT TEST OF SOUND DISCRIMINATION*

If the sounds are alike, record (s). If they sound different record (D)

	A	B	C	D	E	F	G	
1.								
2.								
3.								
4.								
5.								
6.								
7.								
8.								
9.								
10.								

* To be handed to instructor of course.

SCORE SHEET FOR
TEMPLIN SHORT TEST
OF SOUND DISCRIMINATION

SCORE SHEET FOR TAPE RECORDING
TEST OF REFERRAL DECISIONS AND RATINGS

Name _____

1. yes no ___	26. yes no ___	51. yes no ___	76. yes no ___	101. yes no ___	124. yes no ___
2. yes no ___	27. yes no ___	52. yes no ___	77. yes no ___	102. yes no ___	127. yes no ___
3. yes no ___	28. yes no ___	53. yes no ___	78. yes no ___	103. yes no ___	128. yes no ___
4. yes no ___	29. yes no ___	54. yes no ___	79. yes no ___	104. yes no ___	129. yes no ___
5. yes no ___	30. yes no ___	55. yes no ___	80. yes no ___	105. yes no ___	130. yes no ___
6. yes no ___	31. yes no ___	56. yes no ___	81. yes no ___	106. yes no ___	131. yes no ___
7. yes no ___	32. yes no ___	57. yes no ___	82. yes no ___	107. yes no ___	132. yes no ___
8. yes no ___	33. yes no ___	58. yes no ___	83. yes no ___	108. yes no ___	133. yes no ___
9. yes no ___	34. yes no ___	59. yes no ___	84. yes no ___	109. yes no ___	134. yes no ___
10. yes no ___	35. yes no ___	60. yes no ___	85. yes no ___	110. yes no ___	135. yes no ___
11. yes no ___	36. yes no ___	61. yes no ___	86. yes no ___	111. yes no ___	136. yes no ___
12. yes no ___	37. yes no ___	62. yes no ___	87. yes no ___	112. yes no ___	137. yes no ___
13. yes no ___	38. yes no ___	63. yes no ___	88. yes no ___	113. yes no ___	138. yes no ___
14. yes no ___	39. yes no ___	64. yes no ___	89. yes no ___	114. yes no ___	139. yes no ___
15. yes no ___	40. yes no ___	65. yes no ___	90. yes no ___	115. yes no ___	140. yes no ___
16. yes no ___	41. yes no ___	66. yes no ___	91. yes no ___	116. yes no ___	141. yes no ___
17. yes no ___	42. yes no ___	67. yes no ___	92. yes no ___	117. yes no ___	142. yes no ___
18. yes no ___	43. yes no ___	68. yes no ___	93. yes no ___	118. yes no ___	143. yes no ___
19. yes no ___	44. yes no ___	69. yes no ___	94. yes no ___	119. yes no ___	144. yes no ___
20. yes no ___	45. yes no ___	70. yes no ___	95. yes no ___	120. yes no ___	145. yes no ___
21. yes no ___	46. yes no ___	71. yes no ___	96. yes no ___	121. yes no ___	146. yes no ___
22. yes no ___	47. yes no ___	72. yes no ___	97. yes no ___	122. yes no ___	147. yes no ___
23. yes no ___	48. yes no ___	73. yes no ___	98. yes no ___	123. yes no ___	148. yes no ___
24. yes no ___	49. yes no ___	74. yes no ___	99. yes no ___	124. yes no ___	149. yes no ___
25. yes no ___	50. yes no ___	75. yes no ___	100. yes no ___	125. yes no ___	150. yes no ___