

THE EFFICIENCY OF TEACHER REFERRALS IN PUBLIC
SCHOOL SPEECH CORRECTION PROGRAMS

A THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE OF MASTER OF ARTS IN SPEECH AND HEARING
THERAPY IN THE GRADUATE SCHOOL OF THE
TEXAS WOMAN'S UNIVERSITY

COLLEGE OF
ARTS AND SCIENCES

BY
ANDRA REID, B. A.

DENTON, TEXAS
AUGUST, 1968

Texas Woman's University

Denton, Texas

August, 19 68

We hereby recommend that the thesis prepared under
our supervision by Andra Reid
entitled "The Efficiency of Teacher Referrals in
Public School Speech Correction Programs"

be accepted as fulfilling this part of the requirements for the Degree of
Master of Arts.

Committee:

Milton Ryan
Chairman
June B. Ford
Gladys Drake

Accepted: J. L. Morrison
Dean of Graduate Studies

ACKNOWLEDGMENTS

The author extends her sincere appreciation to Dr. Don Ryan for his constructive criticism and patience throughout this course of study.

Gratitude is also extended to Mrs. Gladys Drake and Dr. June Ford, for their criticism and guidance during the author's academic training and during the writing of this thesis.

Sincere thanks goes to the six speech therapists who listened patiently to the scores of tapes. Without their help this study could not have been possible. Special thanks also goes to all of the classroom teachers, principals, and administrators in the Garland system, for their marvelous cooperation.

Deepest gratitude is extended to my family and fiancé, for their encouragement, patience, and love during the long process of writing. It is to them that this thesis is dedicated.

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CHAPTER I

INTRODUCTION

One of the most difficult aspects of public school speech and hearing therapy is frequently that of deciding which children are in need of therapy. Several methods are currently being used, but the most common appear to be those listed by Johnson: "the class visitation, the survey method and the referral method."¹

This study is designed to determine the effectiveness of teacher referrals in the public school speech correction programs. This will be accomplished by a comparison of the survey method and the referral method as means of identifying children with speech disorders. Black is quoted as saying, "Probably the most effective and most satisfying procedure is the direct screening of students by the therapist."² Because of time limitations and the number of students involved in public school situations, it is the major purpose of this paper to determine the efficiency of

¹Wendell Johnson, et al., Speech Handicapped School Children (New York: Harper and Brothers, 1948), p. 347.

²Martha C. Black, Speech Correction in the Schools (Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1964), p. 23.

this method. Nichols states that considerable time is spent in this process by speech therapists each year. He mentions a study by Roe which concluded that, "85% of a sample of 705 clinicians in a nationwide survey . . . spend one to three weeks in screening." Roe also reports that out of this sample of 705 clinicians, "ten per cent take four or more weeks to screen their schools."¹

Many school systems use the referral method as their means of determining speech problems. This method requires the cooperation of teachers, parents, the school nurse, or the school psychologist in reporting those students with speech difficulty. Johnson states that ordinarily where this method is used, the principal or the therapist requests from each grade a list of those students who have speech problems.² Then, the therapist gives each designated pupil a formalized speech examination to determine the presence, the kind, and the severity of the problem. The classroom teacher is therefore responsible for the identification of these children.³

¹A. C. Nichols, "Public School Speech and Hearing Therapy," Speech Pathology, ed. by R. W. Rieber and R. S. Brubaker (Philadelphia: J. B. Lippincott, 1966), p. 121.

²Johnson, op. cit., p. 348.

³Kathleen Pendergast, "Comment On: 'Case Selection in the Public Schools,'" Journal of Speech and Hearing Disorders, XXXI (May, 1966), 399.

Authorities^{1,2,3} who can substantiate their arguments in favor of formalized testing as the best method of selecting students must meet the criticisms of those authorities^{4,5} who believe that the classroom teacher or the inexperienced listener can reliably refer speech problems. Johnson states that the referral method is "effective in the degree to which classroom teachers are aware of speech defects and able to recognize them." He therefore believes that it is the responsibility of the speech clinician to describe and illustrate the various types of speech problems to the classroom teacher. Johnson says that the referral method has a great advantage in that it "enlists the cooperation of each classroom teacher at the outset of the program." The liaison between the therapist and the teacher becomes extensive.⁶ Nichols says

¹Black, op. cit., p. 23.

²Charles F. Diehl and Charles D. Stinnett, "Efficiency to Teacher Referrals in a School Speech Testing Program," Journal of Speech and Hearing Disorders, XXIV (February, 1959), 34-36.

³Harriett P. James and Eugene B. Cooper, "Accuracy of Speech Handicapped Children," Exceptional Children, September, 1966, pp. 29-31.

⁴Herbert J. Oyer, "Speech Error Recognition Ability," Journal of Speech and Hearing Disorders, XXIV (November, 1959), 392.

⁵Elinor Horwitz Perrin, "The Rating of Defective Speech by Untrained Observers," Journal of Speech and Hearing Disorders, XIX (March, 1954), 49-51.

⁶Johnson, op. cit., p. 349.

that the classroom teacher may miss numerous children with speech problems when the referral method is used. He does believe, however, that teachers could possibly be trained for this "limited task."¹

The referral method is perhaps at a disadvantage since it usually takes the classroom teacher several months to really become acquainted with her pupils; therefore, the therapist may not receive referrals until the end of each year or in November of the year. Black states that there will always be new teachers who are not acquainted with the speech services and old teachers who are introduced to new problems. The therapist should emphasize over-referral rather than under-referral.²

Solnit and Stark are quoted as saying:

Assuming from the beginning that the school's major mission is to provide each child with educational opportunities that are optimal for his development in a democratic society, we have been mindful of the confusion that results if teachers are expected to be diagnosticians and therapists, and, conversely, if child psychiatrists, social workers, and psychologists are assumed to be experts in child education.³

The null hypothesis tested in the following experiment states: There is no significant difference in the number of speech problems referred by the classroom teacher

¹Nichols, op. cit., p. 122.

²Black, op. cit., p. 8.

³Albert J. Solnit and Mary H. Stark, "Learning with Teachers," Children, XIV (January-February, 1967), 19.

and those identified by a screening test conducted by the school speech therapist.

Since public school speech therapists are receiving much criticism¹ at the present time, then perhaps changes should be made in the various areas of speech therapy. The problem of determining case loads is only a beginning, but since it occurs prior to any actual therapy, this appears to be the appropriate place to begin. It is this writer's opinion that the time utilized in actually identifying children with speech problems could be spent in more extensive diagnostic procedures if the referral method was used in place of the screening process.

¹Milison, op. cit., p. 4.

CHAPTER II

REVIEW OF THE LITERATURE

The diagnosis of speech disorders in the public schools has been of major concern to experimenters. The following pages consist of an attempt to summarize many of the related studies which have been conducted in this area.

Research by Suydam has suggested that the screening process be used whenever possible, unless there is too little time for this procedure. In this instance, the teacher referral method is recommended. Suydam's study, in 1948, indicated that approximately seventy per cent of the speech therapist population used some form of personal interview or group testing procedure in determining case loads.¹

A variety of materials are used by speech therapists in screening. In 1948, the Bryngelson-Glaspy cards² were popular because this was one of the few formalized testing

¹Vanetta R. Suydam, "Speech Survey Methods in Public Schools," Journal of Speech and Hearing Disorders, XIII (March, 1948), 52.

²Bryng Bryngelson and Esther Glaspey, Speech Improvement Cards (New York: Scott, Foresman and Co., 1941).

procedures available. The test consisted of sixteen cards with three pictures to a card.¹

Even today in this highly mechanized world, many speech therapists prefer making their own materials or using word lists and sentences provided by such people as Fairbanks² and Van Riper.³ These lists are designed especially for articulation testing. There are also lists of vocabulary words⁴ available which may be used as the basis for compiling articulation word lists. Another method of articulation testing involves personal interviews or conversation.⁵ Webster and others state that it is essential that the speech therapist consult with others, in addition to her own testing, to get a more adequate evaluation of the child and his speech habits.⁶ Johnson contends that spontaneous, connected discourse of the child is essential in addition to the formalized test.⁷

¹Ruth Becky Irwin and Barbara Wilson Musselman, "A Compact Picture Articulation Test," Journal of Speech and Hearing Disorders, XXVII (February, 1962), 36.

²Grant Fairbanks, Voice and Articulation Drillbook (New York: Harper and Row, 1960), pp. xii-xvii.

³Charles Van Riper, Speech Correction--Principles and Methods (New York: Prentice-Hall, Inc., 1963), p. 145.

⁴E. L. Thorndike and I. Lorge, The Teacher's Word Book (New York: Bureau of Publications, 1944).

⁵Suydam, op. cit., p. 52.

⁶Elizabeth J. Webster, et al., "Case Selection in the Schools," Journal of Speech and Hearing Disorders, XXI (November, 1966), 354.

⁷Johnson, op. cit., p. 343.

Bukland states that McDonald's deep test of articulation¹ should be used to determine children in need of speech therapy. Bukland also states that the age of the child must be an important determinant. "A nine year old with an articulatory problem almost always needs professional help."²

A popular method for screening is the Templin-Darley test,³ which is considered by many authorities^{4,5} to be one of the most thorough procedures available. This screening test is the shortened form of a longer and more extensive diagnostic test, which is the result of Darley's experience with articulation materials.⁶ Black states that the utilization of a shorter or more concise test does not imply "superficial evaluation." She says that it implies that diagnosis is a "continuous process rather than an opened and closed activity."⁷

¹Eugene T. McDonald, Articulation Testing and Treatment (Pittsburgh: Stanwix House, Inc., 1967), pp. 110-132.

²Evelyn Y. Allen, et al., "Case Selection in the Public Schools," Journal of Speech and Hearing Disorders, XXXI (May, 1966), 159.

³Mildred C. Templin and Frederic L. Darley, The Templin-Darley Tests of Articulation (Ames: State University of Iowa, 1960).

⁴Nichols, op. cit., p. 121.

⁵Black, op. cit., p. 16.

⁶Templin and Darley, op. cit., p. 1.

⁷Black, op. cit., p. 16.

The variety of materials used by speech therapists in screening differ not only in the sounds tested and stimulus words, but also in presentation. Some methods are seeking a spontaneous response and others are looking for the ability to imitate. A study by Siegel, Winitz, and Conkey related that there is "no significant difference in favor of the spontaneous method"; however, "significant differences in favor of the imitative method were obtained." The results of this study reveal that the "imitative method of item presentation does significantly affect articulation responses of normal children but that the effect may be quite small in actual magnitude."¹

There are other elements involved in articulation testing. Henderson states, "It seems that tests of speech-sound articulation should conform as nearly as possible to the requirements for other objective tests, such as intelligence tests." She goes on to state that articulation tests differ, however, because:

. . . one is interested not only in a subject's relative rating on a numerical scale, but also in the exact types of errors made. There can be no set-up standards for right and wrong because none have been determined.²

¹Gerald M. Siegel, Harris Winitz, and Harlan Conkey, "The Influence of Testing Instrument on Articulatory Responses of Children," Journal of Speech and Hearing Disorders, XXVIII (February, 1963), 75.

²Florence M. Henderson, "Accuracy in Testing the Articulation of Speech Sounds;" Journal of Educational Research, XXI (December, 1938), 348.

Henderson says that the examiner's "personal bias" is often identified in test results.¹

Black states that it is imperative that research continue in order to find a diagnostic test which may be given in the time available to speech therapists.² Robertson is quoted as saying:

In my opinion there have been no appropriate tests of articulation for children in the primary grades that have been found to be selection or predictive. For that matter, it is my impression that there is no one test that diagnoses the problem accurately or predicts the success or failure of a primary child in a speech therapy or speech improvement program.³

A speech therapist generally has little difficulty in identifying children with speech problems, but this process frequently becomes more difficult when the classroom teacher attempts it. Many times when a student realizes that his speech is different or that he has a speech problem, he refuses to talk. Often he is labeled "stupid" or simply ignored,⁴ and he is missed in the identification of speech defective children by the classroom teacher.

Clark and others state that the most common speech problems in the schools are: "delayed speech or

¹Ibid., p. 348.

²Allen, op. cit., p. 160.

³Ibid.

⁴Merel Parks, "The Classroom Teacher and Speech Correction," The Quarterly Journal of Speech, XXVIII (December, 1942), 471.

speechlessness," "mispronunciations," "voice inadequacies," and "hesitations";¹ however, Johnson has found that other problems are many times confused with speech problems. These might include "improper grammar," "incorrect pronunciation," "substandard ability to read silently or orally," "more or less habitual lack or preparation for class recitations," "certain types of personality maladjustment," and "mental subnormality."²

Stuttering is many times mislabeled since there are certain interruptions which occur in normal speech and often confuse the untrained listener. A study by Williams and Kent was designed to test the following hypothesis: "Individuals do not consistently respond to interruptions in speech as either stuttered or normal." In this experiment, two groups of adult listeners were asked to mark "all" interruptions on a new sheet when the recording was played again. The third set of instructions asked the listeners to mark the "normal" interruptions. The results revealed that the listeners tended to "hear what they were instructed to listen for at the time." They marked many of the same interruptions labeled as "stuttering" as they did for "normal" interruptions.³

¹Katherine Clark, et al., "Speech Problems in the Schoolroom," Proceedings of the American Speech Correction Association, Vol. VIII (Chicago: Palmer House, 1938), p. 90.

²Johnson, op. cit., p. 3.

³Dean E. Williams and Louise R. Kent, "Listener Evaluations of Speech Interruptions," Journal of Speech and Hearing Research, I (June, 1958), 124-30.

McDowell says that when children are thinking of a word and cannot recall the sounds, they will hesitate and frequently this is labeled "stuttering." McDowell also says that a sudden cramp in the voice muscles can cause difficulty in speaking and many times even this is labeled as a speech defect.¹

A study by Miller and Tiffany determined that group pressure effects judgments of speech sounds.² These two authorities have suggested that "such pressure may be relevant to a wide variety of hearing and listening situations."³

Carter and McKenzie projected that since schools are so crowded, it would be an ideal situation to be able to establish some form of predictive diagnosis. The largest number of speech problems are identified in the first grade; therefore, a test administered before this age to determine which children would "outgrow" their speech problems, would help the therapist in selecting her case load.⁴

¹Allen, op. cit., p. 91.

²Gerald R. Miller and William R. Tiffany, "The Effects of Group Pressure on Judgments of Speech Sounds," Journal of Speech and Hearing Research, VI (June, 1963), 154-55.

³Ibid.

⁴Eunice T. Carter and Buck McKenzie, "Prognostic Testing for Functional Articulation Disorders Among Children in the First Grade," Journal of Speech and Hearing Disorders, XXIII (May, 1958), 124.

Since a predictive test of this nature has not been validated at this time, the following pages reveal studies which are similar to the one to be examined in this paper. Only through cumulative ideas and research can any changes take place.

Several authorities^{1,2} have investigated the correlation between listener reaction and the number of speech sounds misarticulated. Jordan's study was designed to investigate articulation test results and responses made from listener ratings. The subjects consisted of 150 children with mild to severe articulation problems. Thirty-six students majoring in speech therapy were asked to rate the speech tapes of the children on a nine-point scale. Then, all children were tested by the Templin-Darley articulation test. The results revealed that listeners' reactions are dependent upon "the frequency with which articulation deviations occur," and the "degree of articulation deviations."³

Disc recordings were used in a study by Perrin. Experienced and non-experienced judges were asked to listen to the disc recordings of children with and without speech problems. Each listener used a rating sheet. Perrin stated

¹Evan P. Jordan, "Articulation Test Measures and Listener Ratings of Articulation Defectiveness," Journal of Speech and Hearing Research, III (December, 1960), 303.

²Perrin, op. cit., pp. 49-51.

³Jordan, op. cit., p. 303.

that the rank orders for the trained and untrained groups were then determined by assigning points to each voice being rated. The results indicated that "trained and untrained judges do not differ significantly in their evaluations of the severity of functional articulation defects." The correlation coefficient between the number of sounds misarticulated and the judges' rankings was significant at better than the one per cent level for the trained judges, and at the four per cent level for the untrained listeners.¹

Of importance is the study by Diehl and Stinnett, who conducted an experiment in seventy-two Kentucky counties where there had never been a public school speech correctionist. Only the second grade level was included in the study and each of the teachers was asked to fill out a questionnaire on each child in her room. No definition of terms was given. Each of the 3061 second graders was asked a patterned set of questions by two certified speech therapists and if a speech problem was noted, the child was administered the Hejna Developmental Articulation Test. The results of the experiment revealed that the second grade teachers failed to identify 42.7 per cent of the group. The percentage of correct teacher identifications for the various types of speech disorders were as follows: "articulation, 60.6 per cent; voice disorders, 36.9 per cent; articulation

¹Perrin, op. cit., pp. 49-51.

and voice, 70.0 per cent; rhythm, 44.4 per cent; rhythm and articulation, 66.6 per cent." The teachers correctly identified 81.6 per cent of the severe-type (four or more sound errors) articulation cases as compared with 42.7 per cent of the cases with mild articulation defects. Regardless of the type and degree of difficulty of the defects, approximately two of every five cases were not identified in any way. These conclusions made by Diehl and Stinnett also indicate that an elementary grade teacher with no orientation in speech disorders can be expected to locate speech defective children with less than 60 per cent of accuracy. These same teachers can be expected to identify severe defects in articulation with slightly better than 80 per cent of accuracy. Teachers appearing to be less successful at identifying children with voice disorders were able to recognize speech defects in boys as well as in girls.¹

Another study, by James and Cooper, was designed in much the same manner as the study above, with one major exception: the teachers were given a written definition of speech handicaps. An added purpose in this study was to determine the extent to which the teacher is able to identify speech handicapped children in relation to the type and/or severity of the disorder. The examiner screened 718 children and diagnosed 242 as having speech irregularities.

¹Diehl and Stinnett, op. cit., pp. 34-36.

Only ninety-eight of these children were referred by their classroom teachers. There was less accuracy in the identification of voice disorders as opposed to the accuracy in the identification of articulation problems.¹

Oyer conducted a study in order to test the following null hypothesis: "There is no significant difference in speech error recognition ability between seniors in elementary education and seniors in speech and hearing therapy." This study involved only articulation problems. Oyer stated that error scores of the two groups were computed on the basis of "(1) complete agreement and (2) two out of three agreement of criterion judges." In both instances, the scores obtained were not significant at the .05 per cent level. The null hypothesis was accepted and it could be assumed from these results that classroom teachers are capable of successfully selecting those students with speech difficulties.²

A similar study directed by Schaffer involved six professional speech clinicians and six non-clinicians who were asked to rate fourteen pairs of disc recordings. The discs were concerned with defective speech including stuttering, cleft palate speech, and articulation errors (pre and post therapy). The results indicated that there "was no

¹James and Cooper, op. cit., pp. 29-31.

²Oyer, op. cit., p. 392.

significant difference in the reliability of ratings of clinicians and non-clinicians on understandability."¹

Siegel's study was conducted at Parsons State Hospital and Training Center for mentally retarded children. The project involved two experienced and two inexperienced judges who were asked to score responses on the Templin-Darley Screening articulation test as "correct," "incorrect," or "unscorable," and there was no need to denote the type of error made. Siegel related that there were three two-day occasions for the testing procedures, and each occasion was separated by one week. On the first day, all four examiners tested the twenty-six children. In the interval between Occasion One and Two, the inexperienced examiners were given almost four hours of training, which consisted primarily of practice in scoring. Occasion Three involved a new group of children but no additional training was given. Siegel states that "the purpose of this last occasion was to see whether the skills acquired during the training would generalize to a new group of children." The scores of the four examiners on Occasion One (prior to training) were all very high. On Occasions Two and Three the correlations for all the judges were maintained. The results also indicated that

¹Elliott Schaffer, "An Investigation of the Ratings of Speech Clinicians and Non-Clinicians on Two Aspects of Defective Speech" (unpublished Master's thesis, University of Pittsburgh, 1951), pp. 1-9.

"inexperienced examiners could be trained to be quite reliable with a minimum of training."¹

There have also been numerous studies concerning the identification of hearing losses. Kodman relates that the identification of children with hearing losses is better than chance by classroom teachers, but inefficient when compared to audiometric proceedings.²

Curry also conducted a study on the efficiency of teacher referrals of hearing loss cases. The findings indicated that teachers were referring for special hearing tests only 7.4 per cent of the total number of individuals who might be expected to have a hearing loss. Curry determined that teacher referrals were not efficient.³

As has been indicated from the studies discussed above, there is much variability in the general methods and materials used in the identification of speech problems. Many suggested implications could be made and perhaps one of the most significant made is the factor of severity and its effect on examiner identification of speech problems.

¹Gerald M. Siegel, "Experienced and Inexperienced Articulation Examiners," Journal of Speech and Hearing Disorders, XXVII (February, 1962), 29-35.

²Frank Kodman, Jr., "Identification of Hearing Loss by the Classroom Teacher," Laryngoscope, LXVI (October, 1956), 1349.

³E. Thayer Curry, "The Efficiency of Teacher Referrals in a School Hearing Testing Program," Journal of Speech and Hearing Disorders, XV (March, 1950), 214.

Jerome conducted a study in this area and his results lead to the conclusion that there is no significant difference in the ratings of slightly defective and severely defective speech by the expert and non-expert listener.¹

The study made by this writer in the following pages certainly involves the factor of severity in speech problems, but there was no attempt to describe or control this aspect during the experiment.

¹Eldon Jerome, "A Measure of Speech Acceptability" (unpublished Ph. D. dissertation, Northwestern University, 1948), p. 9.

CHAPTER III

METHODS AND PROCEDURES

As illustrated in the previous chapter, speech therapists are currently receiving much criticism concerning their case loads. The following study is an attempt to investigate and determine the effectiveness of teacher referrals as compared to the survey or screening method popularly used by speech therapists in the public school speech correction programs. Twenty classroom teachers from various locales in the Garland Independent School District were chosen for the study. This was done in order to ascertain a variety of past teaching experiences within the group of teachers; therefore, there was no attempt to control the variable of academic training for the teachers.

Each of the twenty teachers was sent a letter on the first day of the school year, explaining the purpose of the experiment and requesting each teacher's cooperation. In the letter, the following definition of a "speech disorder" by Van Riper was given,

Speech is defective when it deviates so far from the speech of other people that it calls attention to itself, interferes with communication, or causes its possessor to be maladjusted.¹

¹Van Riper, op. cit., p. 16.

The teachers were given two weeks to listen to their students engaged in conversation, and then they were asked to list those they considered speech defective according to the above definition. There was no explanation of the various types of speech disorders. A copy of the letter is included in Appendix A.

After each teacher had composed her list of speech defective students, the screening portion of the Templin-Darley Tests of Articulation (first fifty items) was administered to each child in the twenty classrooms by a certified speech therapist. This test consists of the first sixteen cards of the diagnostic portion of the complete test. In the test manual, Templin stated that "the test re-test reliability coefficients . . . ranged from .93 to .99 on single age groups between two and five years"¹ for both the screening and the diagnostic tests. It was also stated that if the 113 and 176 items used by Templin are "valid measures of articulation," then the fifty items are also a "valid measure."²

The cut-off scores supplied by Templin and Darley for their screening test were utilized to identify an individual as one who did or did not need a more complete study of his articulation. Since the cut-off scores are only provided through age eight, two students were eliminated from the

¹Templin and Darley, op. cit.

²Ibid.

study. These two students were older than eight years of age and had less errors than those designated by Templin and Darley for an eight-year-old. Other students older than eight years were included in the study but they had as many, or more errors, as those determined by Templin and Darley for an eight-year-old. A total of 578 students were included in the study.

After articulation had been evaluated by the speech therapist, tape discs were made on each child. This was accomplished by engaging each child in conversation in order to evaluate his "normal" flow of speech in connected discourse. Three speech therapists were asked to listen to each tape to determine whether or not the child had a voice disorder. There was no description or definition of terms, but each therapist was asked to listen for any problem in communication, with the exception of articulation disorders. If a child was listed by two of the three judges, he was considered to have a voice problem and therefore listed as speech defective. The therapists were asked to list a child if they considered him in need of voice therapy. If the therapist believed the child to have a head cold or some other type temporary malady, another tape was made a few weeks later, and he was then re-evaluated.

A z test was utilized to determine whether or not there was a significant difference in the number of children identified as speech defective by the speech therapists and

those identified by the classroom teachers. The formulas used are included in Appendix B.

CHAPTER IV

RESULTS AND SUMMARY

The procedures used in determining the efficiency of speech referrals by classroom teachers have been described in the previous chapters.

The table included in this chapter shows the distribution of referrals by the individual teachers. The study involved a problem of the difference of proportions between two samples; therefore, a z test was utilized. This test involves a normal curve, and no adjustments were needed for sample size.

The null hypothesis tested states: "There is no significant difference, at the .05 level, in the number of speech problems identified by the classroom teacher and those identified by certified speech therapists."

The results indicate that the z score of +2.15 is greater than the z score of ± 1.96 confidence limits. This critical value of z in the two-tailed test indicates that the +2.15 is greater than the critical values of z at the .05 level of significance. The null hypothesis is therefore rejected.

TABLE I
COMPARISON CHART

Teachers			Speech Therapists		
Teacher	Grade	Identifications	Articulation	Voice	Total
1	1st	4	3	0	3
2	1st	1	3	1	4
3	1st	3	2	0	2
4	1st	2	3	3	6
5	1st	6	5	3	8
6	1st	5	5	2	7
7	1st	5	5	2	7
8	1st	5	6	3	9
9	2nd	1	1	1	2
10	2nd	2	1	0	1
11	2nd	3	4	1	5
12	2nd	3	3	1	4
13	3rd	5	5	1	6
14	3rd	1	4	1	5
15	3rd	0	0	1	1
16	3rd	4	4	1	5
17	3rd	5	5	2	7
18	3rd	3	44	0	4
19	3rd	2	2	1	3
20	3rd	6	3	1	4
	Total	66	66	25	91

Number of students tested = 578

Total number of teacher identifications = 66

Total number of speech therapist identifications = 91

Implications from this study suggest that at this point, the screening process is a more efficient method of speech error identification in the public schools than are teacher referrals. The results indicate that classroom teachers with no training in speech and hearing therapy are not efficient in identifying speech disorders.

Jordan stated that "one factor which might reasonably be supposed to relate to listener reaction is the number of speech sounds misarticulated."¹ In this present study it was noted that an "s" misarticulated in several positions by a third grader was less frequently identified as a speech problem than if three separate sounds were misarticulated inconsistently. This was not measured statistically, however.

It was also noted in this study that only five of the twenty-five voice problems were listed as speech problems by the classroom teachers. Out of these five listed by teachers, three of them had articulation problems in addition. This possibly implies that classroom teachers have more difficulty in identifying voice disorders than they have in identifying articulation problems. This study implies that the type of speech problem could very well have a strong influence on the teacher's ability to identify defective speech.

¹Jordan, op. cit., p. 303.

The following recommendations based on the results of this study are made by this writer. First, it is important to investigate the influence of teacher training sessions on the teacher's ability to identify speech disorders. Nichols states that the classroom teacher could possibly be trained for this "limited task," but without this training, she may miss numerous children with speech disorders.¹ The training could possibly be a part of routine "in-service training" which comes either before the school year begins or during the very first few weeks. In the training session, definitions of speech disorders should be discussed, as well as numerous examples of each major disorder demonstrated.

Another recommendation made, as a result of this study is projective in nature and has also been suggested by such people as Carter and McKenzie.² It encourages further research in the area of predictive testing. This type predictive test would be basically concerned with articulation and could be administered to children prior to entering first grade. It would eliminate the majority of teacher referrals as well as the time-consuming process of screening for the speech therapists.

¹Nichols, op. cit., p. 122.

²Carter and McKenzie, op. cit., p. 124.

In conclusion, this writer believes that the role of the public school speech therapist will continue to be the object of criticism unless more research and experiments are conducted which would enable her to be more clinically oriented. It is believed that the professions of public school speech therapist and clinical speech therapist will split and be almost totally unrelated unless the public school therapist can eliminate many of her time-consuming duties, such as screening, to spend more time in activities such as extensive diagnostics and therapy.

APPENDIX A
LETTER TO THE CLASSROOM TEACHERS

September 5, 1967

Dear Classroom Teacher,

You have been chosen as one of twenty teachers in Garland to participate in an experiment involving speech correction practices and the classroom teacher.

Each year your public school therapist spends approximately one and one-half weeks testing children to identify those who are having difficulty with speech. This time could well be spent on extensive diagnostic testing of each child, if there were some other way of finding these children.

As a participant in this experiment, I am asking you to list those children in your room whom you consider speech defective, according to the definition below:

Speech is defective when it deviates so far from the speech of other people that it calls attention to itself, interferes with communication, or causes its possessor to be maladjusted.

At the first of next week, I will ask for your list and then test all of your students. I will first administer a speech

test and then make one minute tape discs on each child. Six certified speech therapists will listen to the tapes and record those with voice problems; then, all the lists will be compared. An evaluation of this type of identification technique will be made by way of a statistical analysis.

To be of any value to the Garland Schools, I must have your full cooperation. If you have any objections or questions, please contact me at Southgate Elementary School.

Thank you.

W. E. Peters
Assistant Superintendent

Miss Andra Reid
Speech Therapist

APPENDIX B

FORMULAS USED IN PRESENT STUDY

Let $N_1 = 578$ students

$$\underline{P}_1 = \text{a success} = 66 \text{ students} = .114$$

Let $N_2 = 578$ students

$$\underline{P}_2 = \text{a success} = 91 \text{ students} = .157$$

Then:

$$P = \frac{N_1 \underline{P}_1 + N_2 \underline{P}_2}{N_1 + N_2}$$

$$P = \frac{91 + 66}{1156} = .136$$

Using the z test, the following is derived:

$$\mu_{\underline{P}_1 - \underline{P}_2} = 0 \text{ and } \sigma_{\underline{P}_1 - \underline{P}_2} = \sqrt{pq(1/N_1 + 1/N_2)}$$

$$\sigma_{\underline{P}_1 - \underline{P}_2} = \sqrt{\frac{(136)(.869)(z)}{578}}$$

$$\sigma_{\underline{P}_1 - \underline{P}_2} = \sqrt{.000406}$$

$$\sigma_{\underline{P}_1 - \underline{P}_2} = .020$$

$$Z = \frac{\underline{P}_1 - \underline{P}_2}{.020} = \frac{.157 - .144}{.020}$$

$$= +2.15$$

At the .05 level of significance $Z = \pm 1.96$.

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